INDEPENDENT ORBITER ASSESSMENT

ASSESSMENT OF THE EXTRAVEHICULAR MOBILITY UNIT VOLUME 1 OF 2

10 MARCH 1988

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MCDONNELL DOUGLAS ASTRONAUTICS COMPANY HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

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INDEPENDENT ORBITER ASSESSMENT
ASSESSMENT OF THE EXTRAVEHICULAR MOBILITY UNIT FMEA/CIL

10 MARCH 1988

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Assessment

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Independent Orbiter Assessment Assessment of the Extravehicular Mobility Unit System FMEA/CIL

1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986.

The IOA effort performed an independent analysis of the Extravehicular Mobility Unit (EMU) hardware and system, generating draft failure modes criticalities and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. The IOA results were then compared to the most recent (upto December 31, 1987), proposed Post 51-L NASA FMEA/CIL baseline. A resolution of each discrepancy from the comparison was provided through additional analysis as required. This report documents the results of that comparison for the Orbiter EMU hardware.

The IOA product for the EMU independent analysis consisted of four hundred and ninety-seven failure mode worksheets that resulted in three hundred and ninety potential critical items. A comparison was made of the IOA product to the NASA FMEA/CIL baseline (undated, received October 1987) which consisted of 614 FMEAs and 474 CIL items. Differences between the number of IOA worksheets and NASA FMEAs resulted from either different levels of analysis (e.g. a subassembly versus a component) or due to the failure mode not being identified within the original analysis. Errors of omission by the IOA were corrected by additional analysis whereas those within the NASA FMEA are identified within this report for future correction.

All discrepancies resulting from the comparison were offered for discussion however, due to NASA time constraints, only a limited number of these discrepancies were discussed and only a small portion of these resolved. The 153 issues identified in this report with the NASA EMU subsystem manager (SSM); remain to be resolved either by the NASA accepting them or rejecting them. Figure 1 presents a comparison of the NASA FMEA with the IOA final results and any remaining issues.

THe IOA also notes that the EMU secondary oxygen pack (SOP) is now categorized as an emergency subsystem rather than a redundant or back-up subsystem. This recategorization was recommended by the IOA's initial EMU analysis report.

EMU OVERVIEW ASSESSMENT SUMMARY

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* NASA PROPOSED BASELINE AS OF 1 JANUARY 1988

Figure 1 - ASSESSMENT SUMMARY

IOA NASA * ISSUES

FMEA

GLOVES

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2.0 INTRODUCTION

2.1 Purpose

The 51-L Challenger accident prompted the NASA to readdress safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of reevaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the proposed Post 51-L Orbiter FMEA/CIL for completeness and technical accuracy.

2.2 Scope

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

2.3 Analysis Approach

The independent analysis approach is a top-down analysis utilizing as-built drawings to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the proposed Post 51-L NASA and Prime Contractor FMEA/CIL. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEA/CIL which is documented in this report.

- Step 1.0 Subsystem Familiarization
 - 1.1 Define subsystem functions
 - 1.2 Define subsystem components
 - 1.3 Define subsystem specific ground rules and assumptions
- Step 2.0 Define subsystem analysis diagram
 - 2.1 Define subsystem
 - 2.2 Define major assemblies
 - 2.3 Develop detailed subsystem representations
- Step 3.0 Failure events definition
 - 3.1 Construct matrix of failure modes
 - 3.2 Document IOA analysis results

Step 4.0 Compare IOA analysis data to NASA FMEA/CIL 4.1 Resolve differences

- 4.2 Review in-house
 4.3 Document assessment issues
 4.4 Forward findings to Project Manager

Ground Rules and Assumptions 2.4

The ground rules and assumptions used in the IOA are defined in Appendix B.

3.0 SYSTEM DESCRIPTION

3.1 Design and Function

The Extravehicular Mobility Unit (EMU) is an independent anthropomorphic system that provides environmental protection, mobility, life support, and communications for the Space Shuttle crewmember to perform Extravehicular Activity (EVA) in Earth orbit. EVA has been defined for EMU analysis considerations as any time the EMU external environment pressure is below 4.0 psia. A schematic of the EMU is provided in Figure 2.

The EMU has been designed to accommodate an EVA mission with a total duration of 7 hours maximum, consisting of 15 minutes for egress, 6 hours for useful EVA tasks, 15 minutes for ingress, and a 30 minute reserve.

The EMU primarily consists of the Life Support System (LSS), Space Suite Assembly (SSA), and the Caution and Warning System (C&W).

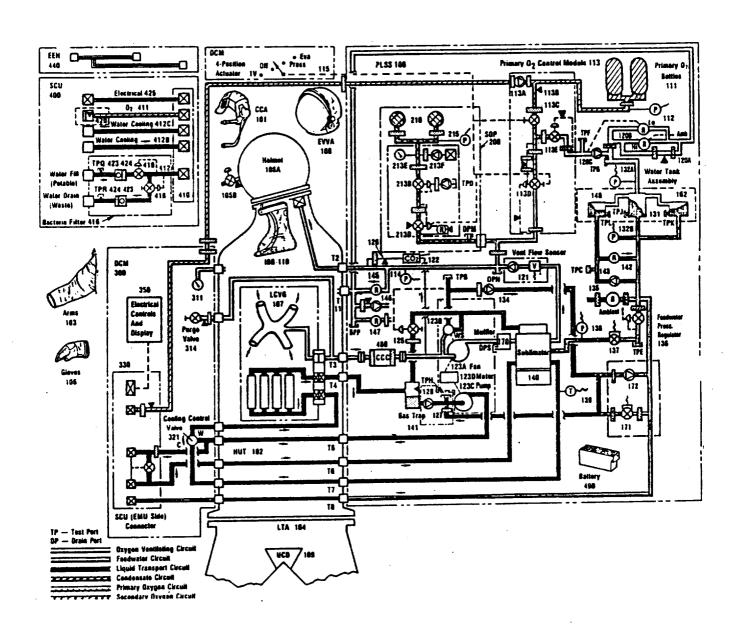
- 1. <u>Life Support Subsystem (LSS)</u> The LSS subsystem provides the following for the suited crewmember:
 - a. Pressurization
 - b. Thermal control
 - c. Breathing oxygen
 - d. Display and control of critical system parameters
 - e. Humidity, odor, and contaminant control
 - f. Electrical power storage and distribution
 - q. Communications

The assemblies and hardware which make up the LSS are described below.

o The Primary Life Support Subsystem (PLSS), reference Figure 3, is an assembly which normally provides the crewmember with oxygen for breathing, ventilation, and pressurization and water for cooling. Additionally, with respect to the IOA analysis, the PLSS provides for the storage and distribution of power throughout the EMU and for the maintenance of the suit atmosphere.

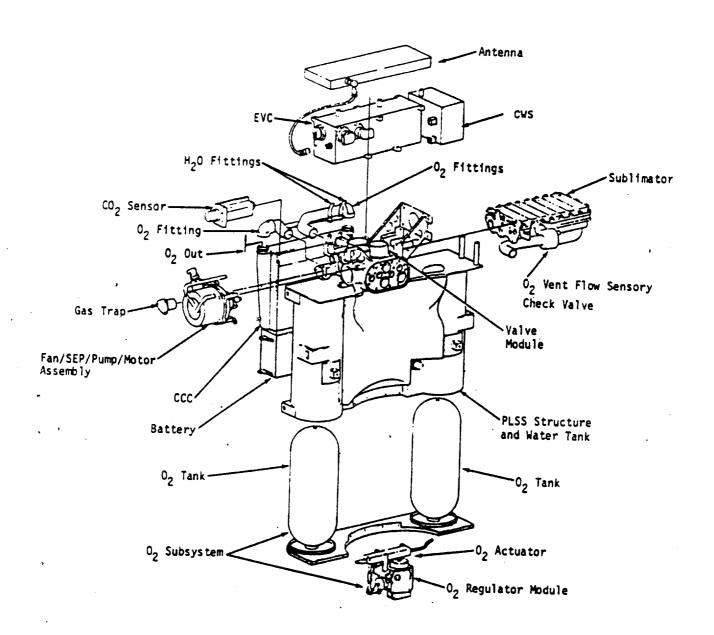
The PLSS consists of oxygen bottles and water tanks together with associated regulators, relief valves, and plumbing. Also contained within the PLSS are a water pump, an air circulation fan, a sublimator used for water cooling, and a water separator used to remove excess moisture from the ventilation lines. Integral to the PLSS are several sensors used by the Caution and Warning System (CWS) in monitoring life support subsystem function.

Figure 2 - EMU FUNCTIONAL SCHEMATIC



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Figure 3 - PLSS, EVCS, AND CWS



ORIGINAL PAGE IS OF POOR QUALITY Within the PLSS, the Contaminant Control Cartridge (CCC) contains an activated charcoal bed for trace gas removal, a LiOH bed for CO2 removal, and a particulate filter to remove solid particles. The CCC is installed in the back of the PLSS and is replaceable in flight for EMU recharge.

EMU mission power requirements during EVA are satisfied by the PLSS battery which stores and provides the electrical power for the operation of all electric components of the EMU, reference Figure 4. The battery mounts into the back of the PLSS, is replaceable in flight, and can be recharged while installed in the PLSS.

The Secondary Oxygen Pack (SOP), reference Figure 5, is a functionally independent life support system, providing the EMU with an emergency back-up oxygen system for a minimum of 30 minutes. It provides oxygen for suit loop backup pressure regulation and an open loop oxygen purge for removal of heat, CO2, and humidity in the event of a loss of the primary function. The SOP is mounted to the bottom of the PLSS and employs the same oxygen delivery path as the PLSS. Due to the numerous critical functions supported by the SOP, its operation and hardware are discussed in detail in the following paragraphs.

The SOP assembly contains two oxygen storage pressure vessels, a two stage regulator, a dialtype pressure gauge, a pressure transducer, and an oxygen fill connector (for servicing the SOP through Ground Servicing Equipment only).

Oxygen from the SOP is controlled by a two-stage regulator. The second-stage regulator also acts as the shutoff valve for this system. The second-stage regulator is caged when the oxygen actuator is in the OFF, IV, and PRESS positions. When the oxygen actuator is placed in the EVA position, the second-stage regulator is uncaged and oxygen is allowed to flow as demanded. The second-stage regulator also has a manual override that provides for crewmember checkout of the SOP during Pre-EVA operations.

The first-stage regulator reduces the nominal supply pressure of approximately 6000 psig to an interstage pressure of 240 to 280 psig. The second-stage regulator further reduces the interstage pressure to maintain the ventilation loop at

3.33 to 3.55 psid over a flow range of 4.51 to 5.26 lb/hr, 3.33 to 3.9 psid over 1.01 to 4.5 lb/hr, and 3.4 to 3.9 psid over 0.06 to 1 lb/hr.

If the second-stage regulator fails open, the outlet of the regulator acts as a flow-limiting orifice, limiting flow to 7.49 lb/hr, allowing the suit relief valve to maintain suit pressure. The second-stage regulator is designed to maintain suit pressure with an upstream pressure equal to full tank pressure.

Initiation of the SOP pressure make-up requires no action by the crewmember. The SOP purge is used to deliver oxygen or to remove co2, heat, and humidity from the system and is initiated by the crewmember manually opening the DCM purge valve. In this manner, suit pressure is controlled to 3.33 to 3.9 psid and a maximum oxygen flow of 4.9 lb/hr is delivered from the SOP through the helmet over the body, and then overboard via the purge valve to remove CO2, heat, and humidity. A backflow check valve in the PLSS ventilation duct helps direct all flow to the helmet.

If the purge is initiated by the crewmember opening the helmet purge valve on the helmet. Suit pressure is controlled from 3.33 to 3.9 psid and a flow of 2.5 lb/hr is delivered through the helmet. Flow in this mode is into the helmet through the vent pad, over and around the crewmember's head, and then out through the helmet purge valve; no cooling is provided.

- O DCM The Displays and Controls Module (Figure 6) contains the visual displays and electrical and mechanical controls required for operation of the EMU by the EVA crewmember. Contained in the DCM are the cooling control valve, the suite pressure gauge, a purge valve, the SCU interface connector, a significant portion of the EMU electrical control electronics and switches, and the remote actuator for oxygen regulators. The DCM mounts directly to the front of the HUT.
- o SCU The Service and Cooling Umbilical is a 12-ft umbilical that consists of three water hoses, a high-pressure oxygen hose, electrical wiring and bacteria filters. The SCU supplies the PLSS with electrical power, communications, oxygen, waste water drainage, and water cooling from the Orbiter during pre- and post-EVA operations. It also supplies the EMU with recharge of the oxygen tanks, water tanks, and battery.

The vehicle end of the SCU consists of four ECLSS connections and one electrical connector that connects the SCU to the Orbiter service panel. The connections are permanent and do not require crewmember operation.

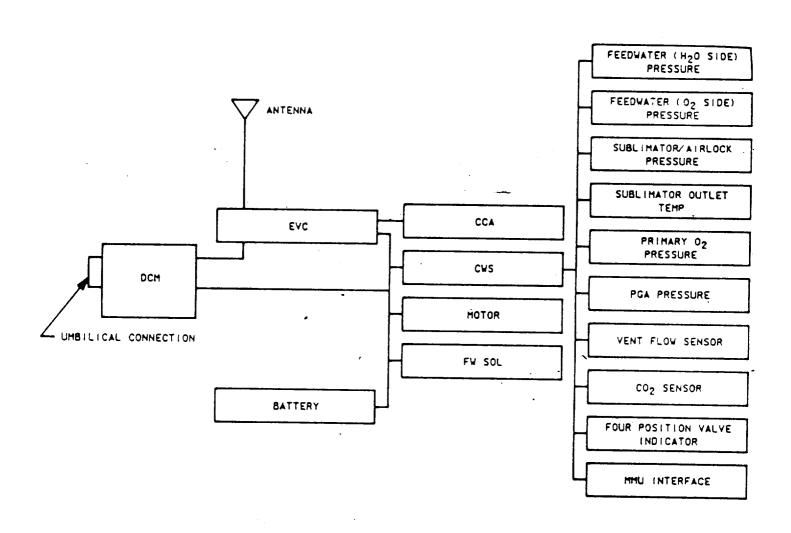
The common connector on the EMU end of the SCU combines the four fluid and one electrical circuit connector into a single connector operated by the crewmember.

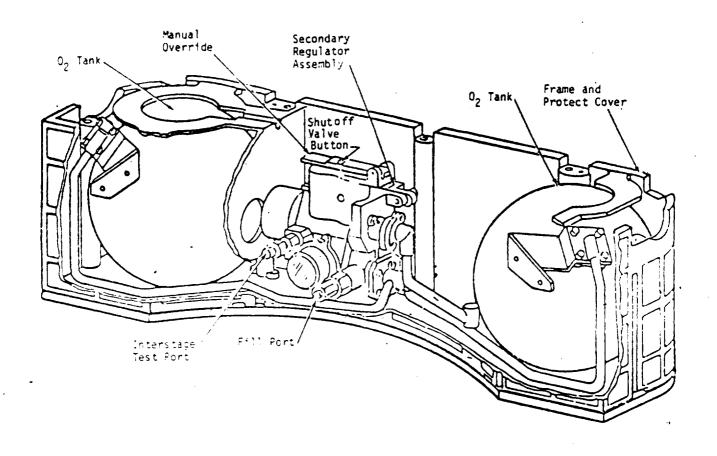
- o EVCS The EMU radio is a UHF/AM transceiver installed within the PLSS (reference Figure 3). It provides the following basic functions.
 - o Duplex voice communications with another EVA crewmember and the Orbiter
 - o Biomedical (ECG) Telemetry via a subcarrier
 - o A backup communications mode that provides simplex voice-only communications between the Orbiter and EVA crewmembers

Additionally, the radio provides audible caution and warning tones when cued by the CWS to alert the crewmember in the event of abnormal or unsafe conditions.

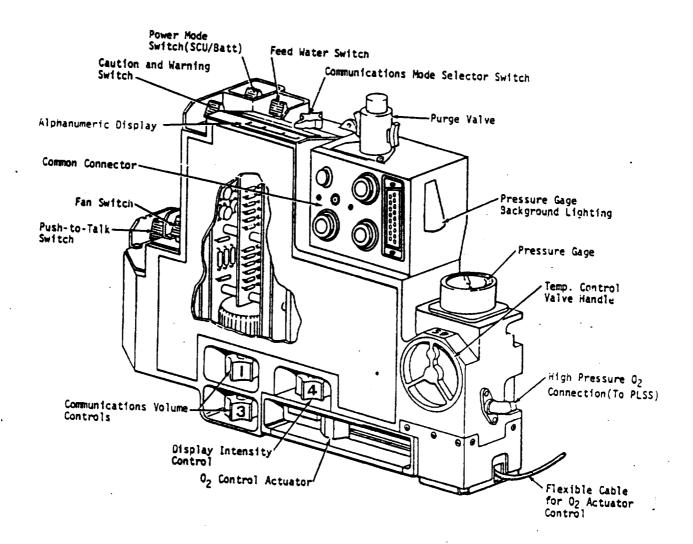
The low profile, omnidirectional UHF antenna is mounted in a pocket of the thermal cover on top of the PLSS. It consists of three resonating cavity antennas, one for each of the frequencies used.

Figure 4 - EMU ELECTRICAL INTERFACES





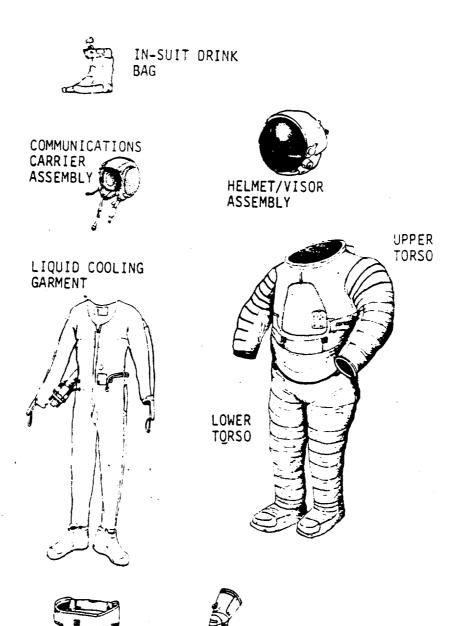
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- 2. Space Suit Assembly (SSA) The SSA, reference Figure 7, provides crewmember enclosure for all EVA operations. Containment of the pressurized environment, ventilation and cooling loop support, crewmember mobility and crewmember visibility are the primary functions provided by the SSA. The assemblies and components comprising the SSA are discussed in the following paragraphs.
 - HUT and Arms: The hard upper torso includes 0 provisions for the attachment of the helmet/visor, arms, lower torso, PLSS, and DCM. The upper torso consists of a hard torso section, the upper half of the waist ring, the lower half of the helmet neck ring, and the TMG. Integral to the upper torso structure is the channeling for both cooling water circulation and ventilation oxygen circulation. Each arm consists of an upper arm and a lower arm connected by the arm bearing. The upper arm includes the upper torso interfacing scye bearing, a shoulder joint, a conformal bladder, and a TMG. The lower arm includes the glove interfacing wrist disconnect, an elbow joint, a conformal bladder, and a TMG.
 - o LTA: The lower torso assembly provides coverage for the crewmember from the waist down. It includes a waist bearing, waist section, legs, boots, boot soles, fabric restraint, bladder, and TMG. The top of the lower torso is the lower half of the waist ring, which provides space suit assembly separation for donning, doffing and support for the waist section and hip joints. The redundant axial restraint system transmits loads through all joints from the boots to the lower half of the waist ring.
 - o Gloves: The EV glove provides protection from both vacuum and temperature extremes for the crewmember's hand. A conformal urethane bladder provides pressure integrity while a polyester cloth restraint system keeps the bladder from deforming when pressurized. A multi-layer insulation (MLI) thermal blanket covers the bladder/restraint system with an Ortho fabric outer layer over the MLI. An adjustable plam restraint bar enables the crewmember to tighten the glove palm area as required for hand mobility.
 - o Helmet/Visor Assembly: The helmet/visor consists of the helmet bubble and the visor assembly, which are permanently attached. The bubble is a clear rigid pressure-retaining vessel made from UV-stabilized polycarbonate material. Integral to

Figure 7 - SSA



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GLOVES .

the helmet bubble are the helmet neck ring, which attaches to the upper torso neck ring, and the vent pad, which directs the oxygen flow to the helmet over the crewmember's face for effective carbon dioxide removal. The helmet purge valve is located on the left side of the helmet.

The visor assembly protects the crewmember and helmet from thermal and solar radiation. It consists of visors, pivot and latch mechanisms, center and side eyeshades, and supporting structures for the visors and the shades. The visors are fabricated from UV-stabilized polycarbonate and polysulfane material with thermal/optical coatings applied to the inner surface.

- elastic garment worn against the crewmember's body. The garment supports a network of tubing that circulates cooling water over the body. It also supports a network of ducting that draws ventilating gas from suit extremities to complete the suit ventilation loop. Connections to the ducting in the HUT for both cooling water and vent flows are made at the multiple connector.
- o CCA: The comm cap is a fabric skull cap encapsulating microphone and earphone electronic modules.
- O UCD: The male UCD is a rubberized fabric bladder worn inside the cooling garmet around the waist with a roll-on cuff for interfacing with the crewmember. Urine contained in the UCD may be dumped into the urine tube of the Waste Collection System (WCS). The UCD can contain a maximum of 32 fluid ounces of urine.
- 3. Caution and Warning System (CWS) The EMU caution and warning system monitors system configuration, environmental parameters, and consumables status. When detected, faults are displayed to the crewmember automatically. The crewmember can display suit parameters and consumables status at any time. The Shuttle EMU is independent of ground monitoring and control.

The CWS microprocessor is the heart of the EMU CWS and is located on the top side of the PLSS. This box contains the central processing unit, the memory, the analog to digital converters, and the latching relays necessary to processing incoming sensor information and providing it to the crewmember.

3.2 Interfaces and Locations

The EMU interfaces with the Shuttle Orbiter airlock, its mission equipment provisions, and the MMU.

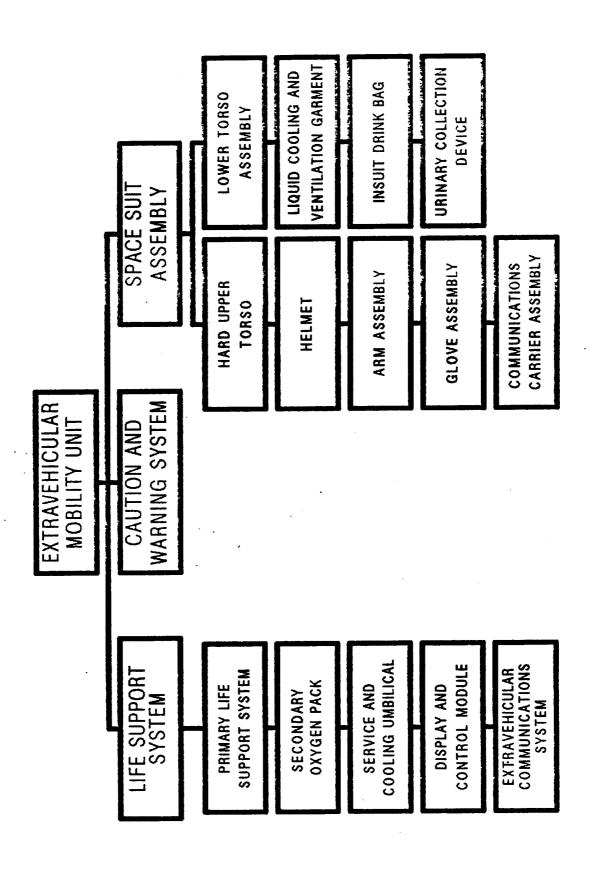
The Orbiter airlock provides stowage for the EMU during launch, orbit, and reentry by means of the EMU mount. The EMU mount serves as the EMU donning and doffing station during EVA preparation and post-EVA operations in the airlock. During EVA prep and post activities, the EMU is connected to the Orbiter Environmental Control and Life Support Subsystem (ECLSS) in the airlock by the SCU for airlock-supplied oxygen, cooling water, communications, and power. Before a second EVA, the EMU is connected to the Orbiter ECLSS by the SCU for EMU recharge. During recharge, the EMU is stowed in the airlock on the EMU mount which serves as a recharge station to permit simultaneous water and oxygen charging, LiOH cartridge replacement, and battery charging or replacement.

The EMU interfaces with crewmember restraint and translation provisions in the airlock and cargo bay. These provisions include handholds, handrails, foot restraints, and tether attachment points.

The Manned Maneuvering Unit (MMU) provides the EVA crewmember a free space maneuvering capability outside the Orbiter cargo bay. The EMU latches to the MMU with the passive half of the latching device provided by the PLSS. The MMU contains the active half of the latching mechanism. Additionally, the MMU support station provides restraints and handrails to aid the EVA crewmember in donning and doffing the MMU.

3.3 Hierarchy

Due to the approach employed by the IOA, the EMU system was analyzed in a hierarchal manner to ensure consistency in fault path definition and in the identification of failure effects. The top level hierarchy employed for EMU analysis considerations is presented in Figure 8.



4.0 ASSESSMENT RESULTS

The IOA analysis of the EMU hardware initially generated 497 failure mode worksheets and identified 390 Potential Critical Items (PCIs) before starting the assessment process. facilitate comparison, 169 additional failure mode analysis worksheets were generated. These analysis results were compared to the proposed NASA Post 51-L baseline of (the most recent available as of December 31, 1987). The discrepancy between the number of IOA and NASA FMEAs can be explained by the different approach used by NASA and IOA to identify failure modes or simply by errors of omission. Errors of omission and incongruities in analysis detail by the IOA were corrected by additional analyses (reference appendix E). Fifty-three (53) failure modes were identified by the IOA analysis that were not covered by the NASA The IOA recommends the addition of all these failure modes to the NASA FMEA baseline; however, only forty-two were considered issues due to CIL impacts.

In the analysis report, the EMU was EVCS included as an area of analysis; however, in the assessment report the EVCS has not been included due to its incorporation into the IOA communications and tracking report. Additionally, the IOA did not encompass electrical power harnesses and connectors per the approval of the IOA NASA task monitor.

With regard to the issues, the IOA has identified a total of one hundred and fifty-three (153). Ninety (90) of these are concentrated in the PLSS and the DCM. This was not unexpected due to each subsystem's complexity and significant use of redundancy. These features resulted in different levels of analysis and in different determinations of redundancy by both the IOA and the NASA. Another area of PLSS and DCM issues resulted from differing usage of screen B detectability requirements. The NASA established an interpretation that so long as the crewmember could obtain safe haven upon detection the screen would be passed; however, the IOA disagreed with the use of an emergency system (the SOP) to support obtaining safe haven.

The largest remaining block of issues (40) are distributed throughout the HUT, helmet, arm assemblies, glens, and the LTA. Although many of these issues are similar in cause to those of the PLSS and the DCM (namely different levels of analysis or different interpretation of redundancy), a large group of these resulted from a common failure mode - loss of pressure integrity. The NASA would "qualify" the failure mode as loss of pressure maintenance capability in excess of SOP make-up capability. The IOA's concern was that it automatically assumed loss of the SOP in assigning a 1/1 criticality; the IOA would prefer a 2/1R with a failure of screen B and screen C to reflect the failure scenario.

The IOA also notes that the SOP has been determined to be an emergency subsystem to the EMU. The IOA recommended the SOP to be just that in the IOA analysis report issued in 1986.

In the following, the unmapped IOA column is the raw number of IOA failure modes. The mapped IOA column is the number of IOA failure modes after they have been mapped into the NASA FMEAs. The issues column is the IOA failure modes that were unable to be mapped onto NASA FMEAs.

EMU	IOA Unmapped	Mapped	NASA	ISSUES
LSS (Total) PLSS SOP SCU DCM	489 225 30 38 178	508 227 33 41 189	455 217 31 37 156	104 48 5 4
C&W	18	18	14	5
SSA (Total) HUT Helmet Arms Gloves LTA LCVG IBD, UCD, CCA	172 34 18 21 20 44 16 19	180 35 18 23 21 46 17 20	159 28 17 24 20 41 17	49 12 2 7 6 13 1 8
Total	661	688	614	153

Appendix C presents the detailed assessment worksheets for each failure mode identified and assessed. Appendix D highlights the NASA Critical Items and corresponding IOA worksheet ID. Appendix E contains IOA analysis worksheets supplementing previous analysis results reported in Space Transportation System Engineering and Operations Support (STSEOS) Working Paper No. 1.0-WP-VA86001-15, Analysis of the Extravehicular Mobility Unit, 15 December 1986. Appendix F provides a cross reference between the NASA FMEA and corresponding IOA worksheet(s). IOA recommendations are also summarized therein.

A summary of the quantity of NASA FMEAs assessed, versus the recommended IOA baseline, and any issues identified is presented in Table I.

Table I Sur	mmary of IO	A FMEA Asse	essment
Component	NASA	IOA	Issues
LSS (Total) PLSS SOP SCU DCM	455 217 31 37 156	508 227 33 41 189	104 48 5 4 42
C&W	14	18	5
SSA (Total) HUT Helmet Arms Gloves LTA LCVG IDB, UCD, CCA	159 28 17 24 20 41 17	180 35 18 23 21 46 17 20	49 12 2 7 6 13 1
TOTAL	614	688	153

A summary of the quantity of NASA CIL items assessed, versus the recommended IOA baseline, and any issues identified is presented in Table II.

Table II St	ummary of I	A FMEA Ass	sessment
Component	NASA	IOA	Issues
LSS (Total) PLSS SOP SCU DCM	365 189 27 33 102	413 205 28 37 126	22 8 - 14 -
C&W	14	17	-
SSA (Total) HUT Helmet Arms Gloves LTA LCVG IDB, UCD, CCA	109 17 13 23 14 31 7 4	134 24 13 23 17 38 8 11	18 5 1 2 3 7 1
TOTAL	474	547	40

Table III presents a summary of the IOA recommended failure criticalities for the Post 51-L FMEA baseline. Further discussion of each of these subdivisions and the applicable failure modes is provided in subsequent paragraphs.

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Table III Sum 	mary 0. +	10A R	+	naea ra. +	11ure C:	ritica.	lities
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
LSS (Total) PLSS SOP SCU DCM	25 5 20 - -	198 143 5 1 41	146 37 3 36 61	41 22 - - 19	49 10 2 2 35	43 9 3 2 28	502 226 33 41 184
C&W	-	8	9	_	-	_	18
SSA (Total) HUT Helmet Arms	8 3 1 1	63 9 2 15	56 10 9 6	4 1 1 1	9 1 3 -	36 8 2 -	171 32 18 23
Gloves LTA LCVG IDB,UCD,CCA	2 1 - -	5 26 3 3	9 9 5 8	1 - -	1 1 - 3	3 8 9 6	20* 46 17 20
TOTAL	33	261	202	45	58	79	673

^{*} Certain analyses by IOA for this item were deleted for technical reasons.

Of the failure modes analyzed, twenty-four were determined to be potential critical items. A summary of the IOA recommended critical items is presented in Table IV.

			_				+
Table	IV Summ	nary of	IOA Re	commer	nded Cri	tical 1	tems
Critic	ality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
LSS (FPLSS SOP SCU DCM	Total)	25 5 20 -	198 143 5 1 41	146 37 3 36 61	28 16 - - 12	49 10 2 2 35	413 205 28 37 126
C&W		-	8	9	-	_	17
HUT Helm Arms Glov LTA LCVG	es	8 1 1 2 1 -	63 9 2 15 5 26 3	56 10 96 99 58	3 1 - 1 - 1	9 1 3 - 1 1 -	134 24 13 23 17 38 8 11
TOT	AL	33	261	202	31	20	547
+					1	•	•

The scheme for assigning IOA assessment (Appendix C) and analysis (Appendix E) worksheet numbers is shown in Table V.

	Table V IOA Worksheet Numbers
Component	IOA ID Number
LSS	100-499, 700-799
SSA	601-699, 800-899

4.1 Assessment Results - PLSS

The PLSS Assessmeth encompassed two hundred and twenty-seven (227) failure modes applicable to various PLSS components and assemblies. Of this number, 48 were considered to be IOA issues with the NASA analysis. As stated earlier, many of these issues have resulted from different levels of analysis or different determinations of redundancy and detectability.

Because no specific trend or "common thread" existed for these issues (other than those previously mentioned), the IOA

recommends use of each individual assessment for evaluation by the NASA.

4.2 ASSESSMENT RESULTS - SOP

The SOP assessment resulted in five (5) issues. One issue has already been reviewed with NASA (new failure mode-blocked SOP bottle inlet filter) and accepted as a 1/1 criticality. The remaining typically result from different levels of analysis and scenarios definition.

4.3 ASSESSMENT RESULTS - SCU

Three of the four SCU issues resulted from incomplete mission scenario development by the NASA. The IOA believes their review and incorporation by the NASA will result in more complete mission profiles by the NASA. The remaining issue (IOA ID No. 349) is solely with the determination of mission impact.

4.4 ASSESSMENT RESULTS - DCM

One hundred and eighty-nine (189) failure modes were addressed in thye IOA DCM assessment. Forty-two (42) of these were determined to be issues with the NASA analysis. As with the PLSS, no specific "common thread" is evident throughout a majority of these issues except for differences in levels of analysis and determinations of redundancy and detectability. Each of the DCM issues should be reviewed and evaluated based an individual merit.

4.5 ASSESSMENT RESULTS - CAUTION AND WARNING

Five Caution and Warning issues resulted from eighteen assessments. Three of these are new failure modes identified by the IOA (possibly due to different levels of analysis). The remaining two issues recommend upgrades to existing NASA criticalities to more appropriately reflect failure mode impacts.

4.6 ASSESSMENT RESULTS -SSA

One hundred and eighty failure modes were assessed by the IOA for the SSA. Forty-nine (49) of these were determined to be issues. These issues typically resulted from differences in failure mode definition, redundancy identification, and screen B assignment.

As stated earlier, many of the SSA issues are related to loss of pressure integrity. The NASA states for many of these that the loss of pressure integrity is in excess of the SOP makeup capability. However, the IOA believes this statement is valid only if it is inherent to the failure mode for the identified

causes. Since the IOA considers such a statement as an assumption of SOP failure, the IOA recommended a 2/1R criticality rather than the 1/1 typically assigned by the NASA.

5.0 REFERENCES

Reference documentation available from NASA was used in the analysis. The documentation used included:

- NSTS 22206, Instructions for Preparation of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL), October 10, 1986
- SVHS 7800, Extravehicular Mobility Unit Design and Performance Requirements Specifications, Rev. M, (no date last date was Rev. L. 11-26-84)
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- 6. SVHS 7808, Specification: Shuttle EMU, SCU and DCM Common Connector (Items 410 and 330), Rev. C, (no date)
- 7. ICD-HSD-4-0001-0D-0, Space Shuttle EMU/MMU Section I Electrical Interface Document, Rev. L, 2-8-85
- 8. ICD-HSD-4-0008-OC, Space Shuttle EMU/EVC Interface Document, Rev. G, 12-13-83
- 9. SV791145, Display, Alphanumeric Four Character; HSD, Rev. A, 11-7-84
- 10. SVSK93600, Schematic, Systems Shuttle EMU; HSD, Rev. U, 1-17-86
- 11. SVSK96170, Schematic, Electrical, DCM; HSD, Rev. B, 3-18-86
- 12. SV778872, Connector, Multiple; HSD, Rev. Y, 6-17-85
- 13. SV778596, Switch, Power Mode; HSD, Rev. D, 1-13-84
- 14. SVSK94600, Schematic, Electrical, DCM; HSD, Rev. AA, 8-10-83
- 15. SV769939, Valve, Temperature Control; HSD, Rev. K, 11-19-82
- 16. SV771887, Switch, Fan/CLIV; HSD, Rev. E. 11-19-84
- 17. SVSK 94002, EMU Wiring Block Diagram; HSD, Rev. N. 12-9-85

- 18. SVSK 107481, Caution and Warning System Block Diagram; HSD, 5-15-84
- 19. SV767794, Switch, Push to Talk; HSD, Rev. D, 1-24-84
- 20. SV767795, Switch, Feedwater Valve; HSD, Rev. F, 10-17-84
- 21. SV767792, Switch, Caution and Warning; HSD, Rev. F, 9-7-85
- 22. SV767786, Switch, Mode Selector; HSD, Rev. F, 1-24-84
- 23. SV767789-02, Battery; HSD, Rev. E, 2-11-86
- 24. SV767789-03, Battery; HSD, Rev. B, 9-26-84
- 25. SV778528, Sensor, Pressure, Primary Oxygen; HSD, Rev. C, 9-29-83
- 26. SV767788, Sensor, Differential Pressure; HSD, Rev. J, 4-1-85
- 27. 0101-10001, Communications Carrier Assembly; ILC, Rev. N, 4-29-85
- 28. SV778873, Pressure Control Module Primary; HSD, Rev. V, 11-17-84
- 29. SV789111, Swich, Sensitive, Hermetic; HSD, Rev. B, 5-27-86
- 30. SV785844, Relief Valve, Dual Mode Oxygen Feedwater; HSD, Rev. T, 12-20-84
- 31. SV771836, Check Valve and Vent Flow Sensor; HSD, Rev. AV, 11-19-84
- 32. SV787993, Motor, Brushless; HSD, Rev. M. 2-7-86
- 33. SV772277, Pump, Water; HSD, Rev. R, 8-6-85
- 34. SV787994, Fan/Separator/Pump Assembly; HSD, Rev. J, 2-7-86
- 35. SV769480, Valve, Pilot Actuated; HSD, Rev. N, 5-30-85
- 36. SV784996, Valve, Check; HSD, Rev. B, 4-27-83
- 37. SV778543, Filter, Pump Inlet; HSD, Rev. H, 7-17-85
- 38. SV767699, Valve, Check, Assembly; HSD, 9-6-77
- 39. SV769403, Valve, Relief Condensate Water; HSD, Rev. N, 5-16-85
- 40. SV784943, Trap, Gas; HSD, Rev. E, 10-30-84
- 41. SV769405, Valve, Relief, Water; HSD, Rev. J, 10-4-82

- 42. SV785860, Valve, Relief; HSD, Rev. H. 11-20-84
- 43. SV787036, Valve, Positive Relief; HSD, Rev. G, 12-14-84
- 44. SV85927, Valve, Negative Relief; HSD, Rev. A, 11-19-84
- 45. SV85970, Box Assy., Caution and Warning; HSD, Rev. N. 12-20-85
- 46. SV784982, Valve, Isolation; HSD, Rev. F, 6-20-85
- 47. SV784998, Valve Assy., Coolant Isolation; HSD, Rev. E, 4-15-85
- 48. SV784985, Valve, Coolant Relief; HSD, Rev. D, 12-4-82
- 49. ICD-HSD-4-0001-OD-0, EMU-MMU Interface (Section II); HSD, Rev. L, 2-8-85
- 50. ICD-HSD-4-0008-OC, Figure 6, EVC Envelope Requirement; HSD, Rev. G, 12-13-83
- 51. SV789152, Harness, Electrical Signal; HSD, Rev. R, 6-24-86
- 52. SV789151, Harness, Electrical Power, HSD, Rev. AD, 6-30-86
- 53. SV767710-07, Secondarry Oxygen Pack; HSD, Rev. V, 7-13-85
- 54. SV778475, Pressure Control Module, Secondary; HSD, Rev. T, 7-2-85
- 55. SV792294-01, Module, Display and Control; HSD, 6-27-86
- 56. SV767690-02, Harness, EMU, Electrical; HSD, Rev. F, 12-10-85
- 57. SV772910, Regulator, Pressure, Water Supply; HSD, Rev. L, 8-20-84
- 58. SV771717, Regulator, Condensate Water; HSD, Rev. M, 11-8-82
- 59. SV778865, Hose Assy., SCU; HSD, Rev. F, 8-15-84
- 60. SV767730-09, Umbilical, Service and Cooling; HSD, 8-8-85
- 61. SV767785, Potentiometer, Display Intensity; HSD, Rev. F, 2-22-84
- 62. SV767784, Potentiometers, Volume Control; HSD, Rev. F, 2-23-84
- 63. SV771763, Harness Assy., Electrical; HSD, Rev. ABH, 6-30-86
- 64. SV771749, Sheath Assy.; HSD, Rev. H. 2-8-84

- 65. SV778872, Connector, Multiple; HSD, Rev. Y, 6-17-86
- 66. SV787027, Purge Valve DCM;p HSD, Rev. C, 10-9-85
- 67. SV792291, Electronic Assy., DCM; HSD, Rev. H, 6-21-86
- 68. SV785003, Connector, Electrical, SCU; HSD, 7-21-82
- 69. SV764255, Connector, Electrical, Circular; HSD, Rev. J, 8-30-78
- 70. SV789153, Harness, Electrical, Caution and Warning; HSD, Rev. V, 6-30-85
- 71. SV779301, Manifold Assy., Oxygen, Water; HSD, Rev. F, 12-9-85
- 72. SV778540, Shear Plate Assy.; HSD, Rev. BU, 5-27-86
- 73. 0102-82437-18, ILC Dover, Table of Operations, Waterline/Vent Tube Assembly, 5-14-86
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- 84. 0106-86059-01, Table of Operations, Palm Restraint Assembly, Glove Modified, ILC Dover, Rev. IR, March 1986

- 85. 0106-23421, Bar, Palm Restraint, ILC Dover, Rev. E, 6-27-83
- 86. 9924, Wrist Disconnect Assembly Glove Side-Right Hand, Large (3.680 ID), Air-Lock, Inc., Rev. C, 7-26-84
- 87. 9814, Wrist Disconnect Assembly Suit SIDE-RH, Air-Lock, Inc., Rev. F, 6-12-86
- 88. 9782, Assembly SCYE Bearing, 8.710 Ball Circles Dia., Air-Lock, Inc., Rev. E
- 89. 9813, Wrist Disconnect Assembly Suite Side-LH, Air-Lock, Inc., Rev. F, 6-12-86
- 90. 9819, Combination Purge Vent Assembly, Air-Lock, Inc., Rev. R, 5-17-83
- 91. 9672, Helmet Assembly, Air-Lock, Inc., Rev. K, 9-23-82
- 92. 9786, Body Seal Closure Hut Half, 16" Inside, Air-Lock, Inc., Rev. D, 5-12-83
- 93. SV772302, Retainer and Inserts, Bearing Shoulder, HSD, Rev. M, 1-10-80
- 94. SV772303, Support, Pivot-Shoulder Bearing, HSD, Rev. E, 7-9-82
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- 96. 9694, Assembly Multiple Connector, Hut Side, Air-Lock, Inc., Rev. J, 5-2-86
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APPENDIX A ACRONYMS

AAP	Airlock Adapter Plate
BITE	Built-in Test Equipment
CCA	Communications Carrier Assembly
CCC	Contaminant Control Cartridge
COMM	Communication
CPU	Central Processing Unit
CWS	Caution and Warning System
C&W	Caution and Warning
DCM	Display and Control Module
EVCS	Extravehicular Communications System
ECLSS	Environmental Control and Life Support System
EMU	Extravehicular Activity
EVA	Extravehicular Activity
EVC	Extravehicular Communicator
EVVA	Extravehicular Visor Assembly
EVCS	Extravehicular Communications System
FM	Failure Mode
GFE	Government Furnished Equipment
HSD	Hamilton Standard
HUT	Hard Upper Torso
IOA	Independent Orbiter Assessment
IDB	Insuit Drink Bag
IVA	Intravehicular Activity
LCVG	Liquid Cooling and Vent Garmet
LiOH	Lithium Hydroxide
LSS	Life Support System
LTA	Lower Torso Assembly
MMU	Manned Maneuvering Unit
OPS	Operations
PLSS	Primary Life Support Subsystem
SCU	Service and Cooling Umbilical
SOP	Secondary Oxygen Pack
SSA	Space Suite Assembly
STS	Space Transportation System
UCD	Urine Collection Device

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APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

- B.1 Definitions
 B.2 Project Level Ground Rules and Assumptions
 B.3 Subsystem-Specific Ground Rules and Assumptions

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions

Definitions contained in <u>NSTS 22206</u>, <u>Instructions For Preparation of FMEA/CIL</u>, <u>10 October 1986</u>, were used with the following amplifications and additions.

INTACT ABORT DEFINITIONS:

 $\underline{\mathtt{RTLS}}$ - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

<u>TAL</u> - begins at declaration of the abort and ends at transition to OPS 9, post-flight

AOA - begins at declaration of the abort and ends at transition to OPS 9, post-flight

ATO - begins at declaration of the abort and ends at transition to OPS 9, post-flight

<u>CREDIBLE (CAUSE)</u> - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

<u>CONTINGENCY CREW PROCEDURES</u> - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

<u>EARLY MISSION TERMINATION</u> - termination of onorbit phase prior to planned end of mission

 $\underline{\text{EFFECTS}/\text{RATIONALE}}$ - description of the case which generated the highest criticality

<u>HIGHEST CRITICALITY</u> - the highest functional criticality determined in the phase-by-phase analysis

 ${\hbox{{\it MAJOR MODE (MM)}}\over\hbox{(OPS)}}$ - major sub-mode of software operational sequence

 $\underline{\text{MC}}$ - Memory Configuration of Primary Avionics Software System (PASS)

MISSION - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)

MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

<u>PRELAUNCH PHASE</u> - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff)

<u>LIFTOFF MISSION PHASE</u> - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

DEORBIT PHASE - begins at transition to OPS Major Mode
301 and ends at first main landing gear touchdown

LANDING/SAFING PHASE - begins at first main gear
touchdown and ends with the completion of post-landing
safing operations

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in <u>NSTS 22206</u>, <u>Instructions for Preparation of FMEA/CIL</u>, <u>10 October 1986</u>, was employed with the following amplifications and additions.

 The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.3 EMU Ground Rules and Assumptions

1. The overall EMU mission will encompass both planned EVA operations (typically two 2-man EVAs are available each Orbiter mission) and unscheduled EVA operations (typically reserved for Orbiter safety-critical EVA tasks).

RATIONALE: Ensures analysis provides worst-case mission impact.

2. The inability of an EMU to perform an EVA or to satisfy a six-hour EVA duration will be considered a mission impact.

RATIONALE: A worst case scenario in which the EMU is employed for prebreathe, or in which the EVA is time critical (e.g. rescue of stranded EVA crewmember), or in which the EVA objectives require full EVA duration is thus obtained for the IOA analysis.

APPENDIX C DETAILED ASSESSMENT

This section contains the IOA assessment worksheets generated during the assessment of this subsystem. The information on these worksheets facilitates the comparison of the NASA FMEA/CIL (Pre and Post 51-L) to the IOA detailed analysis worksheets included in Appendix E. Each of these worksheets identifies the NASA FMEA being assessed, corresponding MDAC Analysis Worksheet ID (Appendix E), hardware item, criticality, redundancy screens, and recommendations. For each failure mode, the highest assessed hardware and functional criticality is compared and discrepancies noted as "N" in the compare row under the column where the discrepancy occurred.

LEGEND FOR IOA ASSESSMENT WORKSHEETS

Hardware Criticalities:

1 = Loss of life or vehicle

= Loss of mission or next failure of any redundant item (like or unlike) could cause loss of life/vehicle

= All others 3

Functional Criticalities:

1R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of life or vehicle

2R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of mission

Redundancy Screens A, B and C:

p = Passed Screen F = Failed Screen NA = Not Applicable

NASA Data:

Baseline = NASA FMEA/CIL

New = Baseline with Proposed Post 51-L Changes

CIL Item :

X = Included in CIL

Compare Row:

N = Non compare for that column (deviation)

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/8 EMU-145	36 5		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 145 TEMPERA	TURE SEN	SOR & HA	RNESS (ITEM	139)
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL: FLIGHT		REDUNDA	NCY SCRE	ENS	CIL ITEM
HDW/FU	NC	A	В	С	TIEM
NASA [/ IOA [2 /1R] [P]	[] P]	[] [P]	[] * [x]
COMPARE [N /N] [N]	ן א	[и]	[N]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[2 /1R] [P] [F j		[A] DD/DELETE)
* CIL RETENTION F	RATIONALE	E: (If ap	plicable		
REMARKS:				ADEQUATE INADEQUATE	. ,
THE IOA RECOMMEND ANALYSIS AND CIL. POSSIBLE LOSS OF IF ACCOMPANIED BY	DC/DC CC A SUBSE	A EFFECT NVERTER QUENT FA	S SHOULD	BE MODIFIED	TO IDENTIF

CREWPERSON WOULD NOT BE WORNED OF HIGH CO2 LEVEL. DISORIENTATION

AND LOSS OF LIFE COULD RESULT.

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:			NASA DATA BASELINE NEW	
	166	H2O RELIEF	VALVE (ITEM 1	.34)
LEAD ANALYST:	G. RAFFAELI	LI		
ASSESSMENT:				
CRITICA FLIG	LITY REI	DUNDANCY SCR	REENS	CIL ITEM
	JNC A	В	С	
NASA [/ IOA [3 /3] [P] []] [F]	[] [P]	[] *
COMPARE [N /N] [N]] [и]	[N]	[]
RECOMMENDATIONS	: (If diffe	erent from N	IASA)	
[3 /3) [:] []	[] (A)	[] ADD/DELETE)
* CIL RETENTION	RATIONALE:	(If applicab	ole) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA RECOMME CRITICALITY, IN THE NASA DID AD FMEA; HOWEVER,	TO THE NASA DRESS CONTAM	ANALYSIS. INATION AS C	AILURE MODE, A THE IOA RECOG CASUAL EVENT I	AND SNIZES THAT IN THE NASA

MODE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DATA BASELINE NEW	
	175	RELIEF	VALVE (ITE	M 172)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL FLIGH HDW/FU	r	REDUNDA A	NCY SCREEN	s c	CIL ITEM
nDW/ro.	NC	A	В	C	
NASA [/ IOA [2 /1R] [P]	[] [[F] [F]	[] * [X]
COMPARE [N /N] [и ј	[N] [N]	[N]
RECOMMENDATIONS:	(If d	ifferent	from NASA)	
[3 /1R] [P]	[F] [[A] DD/DELETE)
* CIL RETENTION	RATIONALI	E: (If a	•	ADEQUATE	
REMARKS:			II	NADEQUATE	[]
THE IOA RECOMMENT BLOCKED) AND FINE THE SCENARIO WILL	DINGS INT	O THE N	ASA ANALYS	IS. THE IC	A BELIEVE

THEREFORE RECOMMENDS THE INCLUSION BE AS A CAUSE FOR THE FAILED

CLOSED CASE IN 172-FM2.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-177	NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 177 COOLANT RELIEF	VALVE (ITEM 172)	
LEAD ANALYST:			
ASSESSMENT:			
CRITICAL		NCY SCREENS	CIL ITEM
FLIGH HDW/FU		В С	
NASA [/ IOA [3 /3] []]]	[] [] [F] [P]	[] *
COMPARE [N /N] [N]	[и] [и]	[]
RECOMMENDATIONS:	(If different	from NASA)	
[3 /3] []	[] [] (A	[] DD/DELETE)
* CIL RETENTION	RATIONALE: (If a	applicable) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA RECOMMEN FMEA.	DS INCLUSION OF	THIS FAILURE MODE IN	TO THE NASA

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-195	5	NASA DATA BASELINE NEW	-
SUBSYSTEM: MDAC ID: ITEM:	EMU 195 CONTAMIN	ANT CONTROL CART	RIDGE (ITEM	480)
LEAD ANALYST:	G. RAFFA	ELLI		
ASSESSMENT:				
CRITICAL FLIGH HDW/FU		REDUNDANCY SCREE	NS C	CIL ITEM
NASA [/ IOA [2 /1R] [1	F] [P]	[] [P]	[] * [X]
COMPARE [N /N] [1	и] [и] [и	[N]	[N]
RECOMMENDATIONS:	(If di	fferent from NASA	7)	
[/] [] [] [[] (AD	[] D/DELETE)
* CIL RETENTION I	ATIONALE:		ADEQUATE NADEQUATE	[]
UPON FURTHER REVI	EW, THE I	OA RECOMMENDS DE	LETION OF T	HIS FAILURE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-202	5		NASA DATA: BASELINE NEW	
MDAC ID:	EMU 202 CHECK V	ALVE AND	VENT FLOW	SENSOR (IT	'EM 121)
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL: FLIGH		REDUNDAN	CY SCREENS		CIL ITEM
HDW/FU	NC	A	В	С	
NASA [/ IOA [2 /1R] [P] [P] [P]	[x] *
COMPARE [N /N] [N] [и ј [n]	[и]
RECOMMENDATIONS:	-				
[2 /1R] [P] [F] [P] (AD	[A] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If ap	plicable) IN	ADEQUATE VADEQUATE	
REMARKS: ALTHOUGH THE NAS. THE IOA DOES NOT CORRESPONDING FA INCLUSION OF THI ADDITIONALLY, TH IOA EFFECTS SHOU DC/DC CONVERTER SHORT. A SIMULT RESULT IN CREWPE	CONSIDE ILURE MO S FAILUR E LD BE MO DUE TO T ANEOUS L	R IT SUFF DE. AS S E MODE IN DIFIED TO HE CURREN OSS OF TH	ICIENT TO UCH, THE I TO THE NAS REFLECT I T LIMITER	REPRESENT OA RECOMME SA FMEA AND POSSIBLE LO OPERATING	A ENDS OF THE WITH THIS

ASSESSMENT DATASSESSMENT ID:	• •			NASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EMU 224 CHECK	VALVE ANI) FILTER	(ITEM 113A)	
LEAD ANALYST:	G. RAF	FAELLI			
ASSESSMENT:					
FLI	ALITY GHT FUNC	REDUNDA A	ANCY SCRE	ENS C	CIL ITEM
NASA [/	1	r 1	£ 1		
NASA [/ IOA [2 /	2]	[P]	[P]	[P]	[] * [X]
COMPARE [N /	n j	[и]	[N]	[N]	[и]
RECOMMENDATION	S: (If o	different	from NAS	SA)	
[2 /	2] [[]	[]	[]	[A] DD/DELETE)
* CIL RETENTIO	N RATIONAI	LE: (If a	pplicable	≘)	
REMARKS:				ADEQUATE INADEQUATE	[]
THE IOA RECOMM INTO THE NASA			THIS FAIR	LURE MODE AN	D ANALYSIS
THIS HUDGE	THE ALEY	-14 -			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-225		TA: TNE [] NEW [X]
	EMU 225 CHECK VALVE A	ND FILTER (ITEM 1137	Y)
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
	LITY REDUN	DANCY SCREENS	CIL ITEM
FLIGH HDW/FU		в с	IIEM
NASA [/ IOA [3 /1]	[] [P]	[] [] [F] [P]	[] * [x]
COMPARE [N /N] [N]	[и] [и]	[N]
RECOMMENDATIONS	: (If differe	nt from NASA)	
[3 /1]	R] [P]	[F] [P]	[A] (ADD/DELETE)
* CIL RETENTION	RATIONALE: (If	applicable) ADEQUAT INADEQUAT	
REMARKS: THE IOA RECOMME	NDS INCLUSION O	F THIS FAILURE MODE	INTO THE NASA

FMEA AND CIL. ALSO, THE IOA ANALYSIS SHOULD BE MODIFIED TO DELETE POSSIBLE LEAKAGE AS AN ADDITIONAL FUNCTIONAL FAILURE MODE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-226		NASA DATA BASELINE NEW			
	EMU 226 CHECK VALVE AN	D FILTER (I	TEM 113A)			
LEAD ANALYST:						
ASSESSMENT:						
CRITICAL: FLIGH	ITY REDUND.	ANCY SCREEN	s	CIL		
	NC A	В	С	ITEM		
NASA [/ IOA [2 /1R] []] [P]	[] [[F]	P]	[x] *		
COMPARE [N /N] [N]	[N] [и ј	[N]		
RECOMMENDATIONS:	(If differen	t from NASA)			
[3 /1R] [P]	[F] [[A] DD/DELETE)		
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []						
REMARKS: THE IOA RECOMMENDS INCLUSION OF THIS FAILURE MODE AND ANALYSIS TO THE NASA FMEA AND CIL. ADDITIONALLY, THE IOA ORIGINAL CRITICALITY ASSIGNMENT HAS BEEN CHANGED FROM 2/1R TO A 3/1R TO REFLECT FURTHER REVIEW.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/8 EMU-304	6		BASELINE NEW		
MDAC ID:	EMU 304 1ST STA	GE REGUL	ATOR (ITEM	f 213B)		
LEAD ANALYST:	G. RAFF	AELLI				
ASSESSMENT:						
CRITICAL		REDUNDA	NCY SCREEN	is	CIL ITEM	
FLIGH HDW/FU		A	В	С	LIEM	
NASA [/ IOA [2 /1R] [P]	[] [[F]	[] [P]	[] * [X]	
COMPARE [N /N] [N]	[и]	[и]	[N]	
RECOMMENDATIONS:	(If d	ifferent	from NASA	7)		
[2 /1R] [P]	[F] ([A] DD/DELETE)	
* CIL RETENTION RATIONALE: (If applicable)						
]	ADEQUATE NADEQUATE	[]	
REMARKS:	DS TNCIII	STON OF	וודגק פועיו	TRE MODE (RI	FCIIT.ATTES	

THE IOA RECOMMENDS INCLUSION OF THIS FAILURE MODE (REGULATES HIGH) AND FINDINGS INTO THE NASA FMEA AND CIL. A DISCUSSION OF THIS FAILURE MODE WITH THE NASA SSM RESULTED IN AN AGREEMENT THAT IT WOULD BE INCORPORATED INTO NASA FMEA 213B-FM3.

ASSESSMEI ASSESSMEI NASA FME	TV	II		12/10, EMU-3:		5						NASA BASE	DATA: LINE NEW	[]	
SUBSYSTEM MDAC ID: ITEM:	M:			EMU 319 SOP F	[LI	آ ت	PORT (QD	ΑN	ID FI	LTI	ER (IT	EM 21	L3F)		
LEAD ANA	LYS	ST:	:	G. RAI	FF	ÆΙ	LLI									
ASSESSME	NT:	:														
(F	ICAL: LIGH: N/FUI			RI A	EDUND	AN(CY B	SCREI	ENS	S C		CIL	ſ	
W1.G1	_				_				_	_	_				_	
NASA IOA	[3	/3]	[P]	[NA	'] 1	[NA]		[]	*
COMPARE	[N	/N]	[N]	[N]	[N]		[]	
RECOMMENI	DA'	CIC	ONS:	(If	di	.f1	ferent	= 1	fro	m NAS	SA)					
	[3	/3]	[3	[]	[]	(AI	[DD/DE		TE)
* CIL RET	CEN	T	ION I	RATIONA	ALE	C:	(If a	app	pli	.cable		ADEQU.		[]	
REMARKS:) Tr	א ריי	AMENII	אכ דאורי	TTC	· T /	N OF	חינ	יםנ	EXTII	m	MODE	EOD			

THE IOA RECOMMENDS INCLUSION OF THE FAILURE MODE FOR COMPLETENESS.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		1	NASA DATA: BASELINE [] NEW []					
MDAC ID:	EMU 320 SOP FILL PO	ORT QD AND FILTE	R (ITEM 213F)					
LEAD ANALYST: G. RAFFAELLI								
ASSESSMENT:								
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM								
	NC A	В	c					
NASA [/ IOA [3 /2R] [] .] [P]	[] [[F] [:	[] * P] [X]					
COMPARE [N /N] [и]	[и] [и]	и] [и]					
RECOMMENDATIONS:	(If diffe	erent from NASA)						
[2 /1R	.] [P]	[F] [:	P] [A] (ADD/DELETE)					
* CIL RETENTION	RATIONALE: (ADEQUATE [] ADEQUATE []					
CREW LOSS IF HIG HAVE BEEN PASSED CRITICALITY. AL FAILURE OF THE 2	H VELOCITY C BY THE FILT SO, IF AND T 13B OR D REG	DXYGEN FLOW OCCU TER. THIS RESULT THE CONTAMINATION GULATORS, CREW L	ODE INDICATES POSSIBLE RS WHEN CONTAMINANTS TS IN A HARDWARE "2" N RESULTS IN OSS COULD RESULT; IS ALSO RECOMMENDED.					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-321		Ŋ	IASA DATA: BASELINE NEW	[]
	321	BLY (ITEM	200)			
LEAD ANALYST:	G. RAFFAE	LLI				
ASSESSMENT:						
CRITICALI FLIGHT		REDUNDANCY	SCREENS		CIL	ſ
HDW/FUN	IC A	В	C			-
NASA [/ IOA [3 /2R] [] [P] [F] [F]	[x] *]
COMPARE [N /N] [и] [N] [N]	[N]
RECOMMENDATIONS:	(If dif	ferent fro	m NASA)			
[1 /1] [] [) [[A D/DE] LETE)
* CIL RETENTION F	RATIONALE:	(If appli				
			A ANI	DEQUATE DEQUATE	[]
REMARKS: SUBSEQUENT TO DIS SSM, THE IOA HAS HEATING/FIRE FROM	UPGRADED (CRITICALIT	N AGREEM Y DUE TO	ENT WITH POSSIBLE	THE	NASA

ASSESSMEN ASSESSMEN NASA FMEA	T	ΙI		12/10/ EMU-34		5							SA D BASEL]]	
SUBSYSTEM MDAC ID: ITEM:	[:			EMU 342 CONDEN	IS?	\TE	Н20	RE	EGU	ILATOI	₹ (rı)	EM 4	18)			
LEAD ANAL	ΥS	т:		G. RAI	F	ÆΙ	LI										
ASSESSMEN	T:																
c				ITY		RE	DUNDA	NC	CY	SCREI	ENS	3			CIL	vr	
			LIGH! /FUI			A			В			С			115	*1	
NASA IOA	[3	/ /3]]	P]	[F]	[P]		[]	*
COMPARE	[N	/N]	[N]	[N]	[N]		[]	
RECOMMEND	PΑT	'IC	ons:	(If	d:	iff	erent	: 1	fro	om NAS	SA))					
	[3	/3]	[]	[]	[]	(AI	[DD/D:] ELE	ETE)
* CIL RET	EN	T]	ON I	RATION	ΛLI	Ξ:	(If a	pp	oli	cable	e)				_	_	
											Il		DEQUA DEQUA		[]	
REMARKS: THE IOA F FMEA.	REC	:01	(MEN	DS INC	LUS	SIC	ON OF	Τŀ	HIS	FAI:	LUI	RE	MODE	INI	O T	ΗE	NASA

ASSESSMENT DATE:			NASA DATA	
ASSESSMENT ID: NASA FMEA #:	EMU-360		BASELINE NEW	• -
MDAC ID:	EMU 360 SUIT PRESSURE	GAGE (ITEM	311)	
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICALI FLIGHT		DANCY SCREEN	s	CIL
HDW/FU		В	С	ITEM
NASA [/ IOA [1 /1] []] [P]	[] [[P]	P]	[] * [X]
COMPARE [N /N] [N]	[и]	N]	[N]
RECOMMENDATIONS:	(If differen	nt from NASA)	
[/] []	[] [] (AD	[A] DD/DELETE)
* CIL RETENTION F	RATIONALE: (If		ADEQUATE	[]
REMARKS:		1	NADEQUATE	[]
THE IOA RECOMMEND ANALYSIS DUE TO E CREDIBLE.	OS DELETION OF FURTHER REVIEW	THIS FAILURE REVEALING TO	E MODE FROM HE SCENARIO	THE IOA AS NON-

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-361	NASA DATA: BASELINE NEW	r 1						
SUBSYSTEM: MDAC ID: ITEM:	EMU 361 SUIT PRESSURE GAGE	(ITEM 311)							
LEAD ANALYST:	LEAD ANALYST: G. RAFFAELLI								
ASSESSMENT:									
	TTY REDUNDANCY	SCREENS	CIL ITEM						
FLIGH HDW/FU		С	11211						
NASA [/ IOA [3 /2R] [] [p] []] [P]	[] *						
COMPARE [N /N] [N] [N] [N]	[]						
RECOMMENDATIONS:	(If different fro	om NASA)							
[3 /2R] [P] [P] [P] (AI	[] DD/DELETE)						
* CIL RETENTION	RATIONALE: (If appli	icable) ADEQUATE INADEQUATE	[]						
REMARKS: THE IOA RECOMMEN INTO THE NASA FM "CAUSE" FOR NASA	DS INCLUSION OF THIS EA. (NOTE: THIS FAI	S FAILURE MODE ANI	D ANALYSIS						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-384	NASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EMU 384 COMMON MULTIPLE CO	ONNECTOR (ITEM 330))
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICALI FLIGHT HDW/FUN	י		CIL ITEM
NASA [/ IOA [2 /2] [] [p] [] ·	[] *
COMPARE [N /N] [N] [N	[א]	[]
RECOMMENDATIONS:	(If different fr	om NASA)	
[2 /2] [] [] [] (AD	[A] DD/DELETE)
REMARKS:	ATIONALE: (If appl	ADEQUATE INADEQUATE	. ,
THE IOA RECOMMEND INTO THE NASA FME	S INCLUSION OF THI	S FAILURE MODE AND	CRITICALITY

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DATA: BASELINE NEW]
MDAC ID:	EMU 385 COMMON MU	LTIPLE C	ONNECTOR	(ITEM 330)		
LEAD ANALYST:	G. RAFFAE	LLI				
ASSESSMENT:						
CRITICALI FLIGHT	ITY R	REDUNDANC	Y SCREENS	_	CIL ITEM	
HDW/FU	IC A		В	С		
NASA [/ IOA [3 /1R] [] [P) [P] [p]] *]
COMPARE [N /N] [N	[]	и] [N]	[)
RECOMMENDATIONS:	(If dif	ferent f	rom NASA)		
[3 /2R] [P) [.	F] [P] (AD	[DD/DEI] LETE)
* CIL RETENTION I	RATIONALE:	(If app		ADEQUATE NADEQUATE]]
REMARKS: THE IOA HAS REVII SOP TO BE NON-REI RECOMMENDS INCLUS REFLECTING A 3/21	DUNDANT TO SION OF TH	THIS FU	ANALYSIS NCTION. RE MODE	AND HAS DE THEREFORE, AND ITS ANA	TERMI THE	INED THE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		NASA DATA: BASELINE NEW	[]
MDAC ID:	EMU 386 COMMON MULTIPLE CONNECTOR	(ITEM 330)	l
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICALI FLIGHT	r ·		CIL ITEM
HDW/FUN	NC A B	С	
NASA [/ IOA [3 /2R] [] [] [] [P] [P] [p]	[] *
COMPARE [N /N] [N] [N] [N]	[]
RECOMMENDATIONS:	(If different from NASA)		
[3 /3] [] [] [] · (AD	[] DD/DELETE)
	RATIONALE: (If applicable)	ADEQUATE IADEQUATE	[]
FAILURE MODE AT A	REVIEW, THE IOA RECOMMENDS A 3/3 CRITICALITY INTO THE TTICAL IMPACT TO IV OPERATI	INCLUSION NASA FMEA.	OF THIS

ASSESSMENT ASSESSMENT NASA FMEA	ID:	12/10/8 EMU-387						ASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:		EMU 387 COMMON	MUL	TIPLE	CON	NECTO	R (:	ITEM 330)	
LEAD ANALY	ST:	G. RAFI	FAEL	LI						
ASSESSMENT	:									
	ITICAL: FLIGHT HDW/FUI	ľ	RE A	DUNDA	NCY B	SCREE	ns C		CIL	Ī
NASA [IOA [/ 2 /1R]	[[P]	[[F]	[[P]	[x] *
COMPARE [N /N]	N]	[N]	[N]	[1]
RECOMMENDA	TIONS:	(If o	liff	erent	fro	m NAS	A)			
Ι	2 /2] [[]	[1	[] (A	[A DD/DE] ELETE)
* CIL RETE	NTION 1	RATIONA	LE:	(If a	ppli		Al	DEQUATE DEQUATE	[]
REMARKS:	COMMEN	OS TNCLI	ISTO	N OF	THIS	FATI	URE	MODE IN	то тн	IE NAS

THE IOA RECOMMENDS INCLUSION OF THIS FAILURE MODE INTO THE NASA FMEA AND CIL. A FURTHER REVIEW OF THE ANALYSIS INDICATED A 2/1R CRITICALITY WAS NOT JUSTIFIABLE AND THE FINAL CRITICALITY OF 2/2 WAS JUSTIFIABLE. THE FINAL CRITICALITY AND ANALYSIS WAS REVIEWED AND AGREED TO BY THE NASA SSM.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-394	1	NASA DATA: BASELINE [NEW [4
SUBSYSTEM: MDAC ID: ITEM:	EMU 394 VOLUME CONT	ROL (ITEM 360)		
LEAD ANALYST:	G. RAFFAELL	.I		
ASSESSMENT:				
CRITICAL: FLIGHT		UNDANCY SCREENS		IL .
HDW/FUI		В	2	TEM
NASA [/ IOA [2 /2] []]	[] [r]] [7] [x] *
COMPARE [N /N] [N]	[и] [и	4] [N]
RECOMMENDATIONS:	(If diffe	rent from NASA)		
[2 /2] []	[] [A] /DELETE)
* CIL RETENTION H	RATIONALE: (7	ADEQUATE { ADEQUATE []
REMARKS: THE IOA RECOMMENI INTO THE NASA FME		OF THIS FAILURE	E MODE AND	CRITICALITY

ASSESSMENT ASSESSMENT NASA FMEA #	ID:	12/10/8 EMU-395						ASA DATA: BASELINE NEW	[]	
SUBSYSTEM: MDAC ID: ITEM:		EMU 395 VOLUME	CON	TROL	(ITE	EM 360)					
LEAD ANALYS	ST:	G. RAFI	FAEL	LI								
ASSESSMENT:	:											
CRI	TICALI FLIGHT		RE	DUNDA	NCY	SCREE	ns		CI	L	7	
H	IDW/FUN		A		В		С		++	Lik		
NASA [IOA [3 /2R] [[[P]	[[P]	[[P]	[X] ³	k
COMPARE [n /n) ([N]	[N]	[N]	[N]	
RECOMMENDAT	TIONS:	(If d	diff	erent	fro	om NAS	A)					
[/] [[]	[]	[] (AI	[DD/	'DE] LET	ΓE)
* CIL RETEN	ITION F	RATIONAI	LE:	(If a	ppli	cable	A!	DEQUATE DEQUATE]	
REMARKS: THE IOA REC	COGNIZE	S THE 1	INCO	RPORA'	10IT	OF T	HIS	FAILURE	MC	DE	: Iì	N NASI
FAILURE MOD	ES 360	-FM1 AN	4D -	FM5 A	ND I	S IN	AGR	EEMENT WI	CTH	r	'AA'	r

INCORPORATION.

ASSESSMEN	12/10/86 EMU-428					NASA DATA BASELINE					ו					
NASA FMEA			2110 11	-, -							•			[j	
SUBSYSTEM:																
			428 PUSH-TO-TALK SWITCH (ITEM 365)													
IIEM.			PUSH-	LO	-11	וכ אנגא	N I	ıcı	1 (1.	I EM	31	33)				
LEAD ANAL	YSI	r:	G. RA	FF.	AE:	LLI										
ASSESSMEN	T:															
			ITY REDUNDANCY SCREENS								CIL					
		FLIGH DW/FU	NC		A			В			С			ITE	M	
NASA	٢	/	1	ſ		1	ſ		1	ſ		ו		ſ	1	*
NASA IOA	[3	3 /2R	j	Ì	P	j	į	P	j	į	P	j		[j	
COMPARE	[]	1 /N]	[N]	[N]	[N]		[]	
				_				_								
RECOMMEND	ATI	CONS:	(If	d.	ıfı	ferent	: כ	fro	om NA	ASA)	1					
	[/]	[]	[]	[]		[]	
							_					((AI	DĎ/DI	EĽE	ETE)
* CIL RET	ENT	ION I	RATION	ALI	E:	(If a	ומב	oli	[cab]	le)						
						•	٠.	•		•	ΑI	DEQUATE DEQUATE	2	[]	
REMARKS:										IN	IAI	DEQUATE	3	[]	
UPON FURT	HEF	REV	IEW THI	3 :	ΙΟ	A CONS	SII	DEF	RS TH	IIS	F#	AILURE	MC	DE 1	NON	I
CREDIBLE A	ANI	REQ														
ITS DELET	ION	1.														

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-439		NASA DATA: BASELINE NEW						
MDAC ID:	EMU 439 FAN SWITCH	(ITEM 366)							
LEAD ANALYST:	G. RAFFAELL								
ASSESSMENT:									
CRITICAL		OUNDANCY SCREENS		CIL ITEM					
FLIGHT HDW/FUI		В	С	11DF1					
NASA [/ IOA [2 /2] [] [P]	[] [[P] [] P]	[] * [X]					
COMPARE [N /N] [N]	[N] [N]	[и]					
RECOMMENDATIONS: (If different from NASA)									
[3 /1R] [P]	[F] [[A] D/DELETE)					
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []									
REMARKS: THE IOA RECOMMENDS INCLUSION OF THIS FAILURE MODE (CLIV POWER "OPEN" LINE/CONTACT OPEN) INTO THE NASA FMEA AND CIL. THE CRITICALITY HAS BEEN UPDATED TO REFLECT CONSISTENCY RELATIVE TO									

NASA FMEA 366-FM6 WHICH THE IOA HAS ASSESSED AND CONCURRED WITH.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/8 EMU-440	6		NASA DATA: BASELINE NEW	[]		
	440	TCH (ITEM	366)				
LEAD ANALYST:	G. RAFF	AELLI					
ASSESSMENT:							
CRITICAL: FLIGHT	ľ	REDUNDANC			CIL ITEM		
HDW/FU	NC .	A	В	С			
NASA [/ IOA [3 /2R] [P] [F] [P]	[
COMPARE [N /N] [и ј [и] [и]	[N]		
RECOMMENDATIONS:	(If d	ifferent f	rom NASA)				
[3 /1R] [P] [F] [[A] D/DELETE)		
* CIL RETENTION H	RATIONALI	E: (If app	licable)				
			•	ADEQUATE ADEQUATE	[]		
REMARKS:					-		
THE IOA RECOMMENI NASA FMEA AND CII CONSISTENCY RELAT ASSESSED AND CONC	I. THE C	CRITICALIT NASA FMEA	Y HAS BEE	N UPDATED	TO REFLECT		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-442		NASA DATA: BASELINE NEW]
	EMU 442 FAN SWITCH (ITEM	366)			
LEAD ANALYST:	G. RAFFAELLI				
ASSESSMENT:					
CRITICAL: FLIGHT		CY SCREENS		CIL ITEM	
HDW/FU		В	С	IIDM	
NASA [/ IOA [2 /1R] [] [] [P] [P] [p]	[) *]
COMPARE [N /N] [N][и] [и]	[]
RECOMMENDATIONS:	(If different f	from NASA)			
[/] [] [] [] (AI	[DD/DE] LETE)
* CIL RETENTION I	RATIONALE: (If app	•	ADEQUATE ADEQUATE	-]
	E IS A DUPLICATION E AND SHOULD BE DE		ID 438, TH	IEREF	ORE, IT

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-460			NASA DATA: BASELINE NEW	[]
	EMU 460 ALPHANUMER	CIC DISPLA	Y (ITEM	1 369)	
LEAD ANALYST:	G. RAFFAEL	LI			
ASSESSMENT:					
CRITICAL: FLIGH	r	DUNDANCY	SCREENS		CIL ITEM
HDW/FU	NC A	В		С	
NASA [/ IOA [2 /2] [] [] []	[X] *
COMPARE [N /N] [] [] []	[N]
RECOMMENDATIONS:	(If diff	erent fro	om NASA)		
[/] [] [] [[] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If appli	•	ADEQUATE ADEQUATE	[]
REMARKS: THIS IOA ANALYSIS WHICH IS NOW WHAY	THE DCM D	ISPLAY WI	LED DI	SPLAY VERS	SUS THE LCI

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-461			SA DATA: BASELINE NEW	[]		
MDAC ID:	EMU 461 CAUTION AN	ID WARNING	G ELECTRON	IICS (ITE	M 150)		
LEAD ANALYST:	G. RAFFAEI	LI					
ASSESSMENT:							
CRITICAL FLIGH	ITY RE	DUNDANCY	SCREENS		CIL ITEM		
	NC A	В	С				
NASA [/ IOA [2 /2] [] [] []	[] * [x]		
COMPARE [N /N] [] [] []	[и]		
RECOMMENDATIONS:	(If diff	ferent fro	om NASA)				
[2 /1R	[P] [F] [P		[A] DD/DELETE)		
* CIL RETENTION	RATIONALE:	(If appl	Δ1	DEQUATE DEQUATE	[]		
REMARKS: THE IOA RECOMMENDS INCLUSION OF THIS FAILURE MODE INTO THE NASA FMEA AND CIL. ADDITIONALLY, THE IOA HAS UPGRADED ITS CRITICALITY TO ENSURE CONSISTENCY WITH THE "LOSS OF DISPLAY" ANALYSIS WHICH IDENTIFY A POSSIBLE, SUBSEQUENT CO2 CONTROL FAILURE AS CAUSE FOR LOSS OF LIFE.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-463		NASA DATA BASELINE NEW				
	EMU 463 CAUTION AN	D WARNING	ELECTRONICS (IT)	EM 150)			
LEAD ANALYST:	G. RAFFAEL	LI					
ASSESSMENT:							
CRITICAL: FLIGHT	ITY RE	CREENS	CIL				
HDW/FUI		В	С	ITEM			
NASA [/ IOA [2 /2] [] []	[]	[
COMPARE [N /N] [] []	[]	[N]			
RECOMMENDATIONS:	(If diffe	erent from	NASA)				
[2 /1R] [P]] [F]		[A] DD/DELETE)			
* CIL RETENTION P	RATIONALE:	(If application	•				
			ADEQUATE INADEQUATE				
REMARKS: THE IOA RECOMMENDS INCLUSION OF THE FAILURE MODE INTO THE NASA FMEA AND CIL. ADDITIONALLY, THE IOA HAS UPGRADED THE CRITICALITY TO REFLECT POSSIBLE LOSS OF LIFE WITH A CONCURRENT CO2 CONTROL							

FAILURE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DATA: BASELINE NEW			
MDAC TD:	EMU 464 CAUTION A	ND WAR	NING ELEC	TRONICS (IT	EM 150)		
LEAD ANALYST:	G. RAFFAE	LLI					
ASSESSMENT:							
CRITICAL FLIGH	ITY R	REDUNDA	NCY SCREE	ens	CIL ITEM		
HDW/FU		\	В	С			
NASA [/ IOA [2 /2] []	[]		[] *		
COMPARE [N /N] []	[]	[]	[]		
RECOMMENDATIONS:	(If dif	fferent	from NAS	SA)			
[2 /1R) [I	P]	[F]	[P]	[A] DD/DELETE)		
* CIL RETENTION	RATIONALE:	: (If a	applicable	e) ADEQUATE INADEQUATE			
REMARKS: THE IOA RECOMMENDS INCLUSION OF THE FAILURE MODE INTO THE NASA FMEA AND CIL. ADDITIONALLY, THE IOA HAS UPGRADED THE CRITICALITY TO REFLECT POSSIBLE LOSS OF LIFE DUE TO A CONCURRENT CO2 CONTROL FAILURE.							

ASSESSM	ASSESSMENT DATE: 12/10/86 NASA ASSESSMENT ID: EMU-468 BASE NASA FMEA #:						DATA ELINE NEW	: []					
SUBSYST MDAC ID ITEM:				4	MU 68 AUTION	AND	WARNI	NG EI	LECTRO	ONICS	II) 3	'EM	150)	
LEAD AN	ALY	ST	:	G	. RAFF	AELLI								
ASSESSM	ENT	:												
	CR		ICA LIG	LIT HT	Y	REDU	NDANC'	Y SCF	REENS			CI IT:		
	:	HD	W/F	UNC		A	1	В	(2			~~.	
NASA IOA	[3	/3]	[]	[]	[]		[]	*
COMPARE	[N	/N]	[]	ί]	[]		Ĺ]	
RECOMME	NDA'	rI(ons	:	(If di	lffer	ent fi	com N	ASA)					
	[3	/3]	[]	[]	ľ]	(A	[DD/1	DELE	TE)
* CIL R		T	ION	RA	rionale	E: (I:	f app]	licab	A	DEQU DEQU	ATE ATE	[]	
THE IOA	REC	COI	MME	NDS	THE NA	SA II	CLUDE	THI	S FAI	LURE	MOD	E IN	TO !	THE

ASSESSMENT DA ASSESSMENT II NASA FMEA #:		12/10/ EMU-47										DATA: LINE NEW	[]	
SUBSYSTEM: MDAC ID: ITEM:		EMU 476 DCM EI	LEC	TF	RONICS	5 ((I)	EM 3	50)						
LEAD ANALYST	:	G. RAI	FA	ΕI	LLI										
ASSESSMENT:															
	CAL:	ITY F		RE	EDUNDA	/N(CY	SCRE	ENS	3			CII		
		NC		A			В			С					
NASA [IOA [3	/ /2R]	[P]	[[P]	[P]		[]	*
COMPARE [N	/N]	[N]	[N)	[N]		[]	
RECOMMENDATIO	ONS:	(If	di	.f1	ferent	5 1	Ero	om NA	SA))					
[3	/2R]	[P]	[NA	A]	[P]	(AI	[DD/[) ELE	ETE)
* CIL RETENT	ION I	RATION	ALE	E:	(If a	apj	p1 :	icabl				ATE]	
REMARKS:									I	IA	DEQU	ATE	[]	
THE IOA RECO	MMEN	DS INC	LUS	SIC	ON OF	Tl	HIS	S FAI	LUI	RE	MOD	E IN	ro 1	THE	NASA

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/80 EMU-478	6		NASA DATA BASELINE NEW	[]
MDAC ID:	EMU 478 DCM ELEC	CTRONICS	5 (ITEM 35	50)	
LEAD ANALYST:	G. RAFF	. RAFFAELLI			
ASSESSMENT:					
FLIGHT			NCY SCREE	CIL ITEM	
HDW/FU	NC	A	В	С	
NASA [/ IOA [3 /2R] [P]	[] [P]	[] [P]	[] *
COMPARE [N /N] [n j	[и]		[]
RECOMMENDATIONS:	(If di	ifferent	from NAS	A)	
[3 /2R] [Pj	[NA]		[] DD/DELETE)
* CIL RETENTION F	RATIONALE	E: (If a	pplicable)	
REMARKS:		•		ADEQUATE INADEQUATE	
THE IOA RECOMMENI	S INCLUS	SION OF	THIS FALI	URE MODE IN	TO THE NASA

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/8 EMU-479	6		NASA DATA: BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EMU 479 DCM ELE	CTRONICS	(ITEM 35	0)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
	LITY	REDUNDA	NCY SCREE	ns	CIL ITEM
FLIG HDW/F	HT UNC	A	В	С	1164
NASA [/ IOA [2 /1] [R] [p]	[] [F]	[] [P]	[x] *
COMPARE [N /N] [N]	[N]	[и]	[N]
RECOMMENDATIONS	: (If d	ifferent	from NAS	;A)	
[2 /1	R] [P]	[F]	[P] (A	[A] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicable	adequate	[]
REMARKS: THE IOA RECOMME FMEA AND CIL.	NDS INCLU	SION OF	THIS FAIL	LURE MODE IN	TO THE NASA

ASSESSMENT DA ASSESSMENT ID NASA FMEA #:				NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 480 DCM ELE	CTRONICS	(ITEM 350)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
FL	CALITY IGHT //FUNC	REDUNDAN A	CY SCREENS	s C	CIL ITEM
NASA [IOA [2	/] [/1R] [p] [P] [P]	[] *
COMPARE [N	/и] [и] [иј [N]	[N]
RECOMMENDATIO	NS: (If d	ifferent	from NASA))	
[2 ,	/1R] [P] [P] [[A] DD/DELETE)
* CIL RETENTION	ON RATIONAL	E: (If ap		ADEQUATE NADEQUATE	[]
THE IOA RECOM FMEA AND CIL.	MENDS INCLU	SION OF T	HIS FAILUF	RE MODE IN	O THE NASA

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-485	NASA DA BASELI N					
SUBSYSTEM: MDAC ID: ITEM:	EMU 485 DCM ELECTRONI	CS (ITEM 350)					
LEAD ANALYST:	G. RAFFAELLI	. RAFFAELLI					
ASSESSMENT:							
CRITICAL		DANCY SCREENS	CIL ITEM				
FLIGH HDW/FU		в с					
NASA [/ IOA [2 /2] []]]	[] [] [F] [P]	[] * [X]				
COMPARE [N /N] [N]	[N] [N]	[N]				
RECOMMENDATIONS:	(If differe	ent from NASA)					
[2 /2] []	[] []	[A] (ADD/DELETE)				
* CIL RETENTION	RATIONALE: (If	f applicable) ADEQUAT INADEQUAT					
REMARKS: THE IOA RECOMMENTED FROM AND CIL. T	DS INCLUSION C	OF THIS FAILURE MODE	INTO THE NASA ISSION CAN				

CONTINUE IF SUFFICIENT LIGHTING WERE AVAILABLE TO READ THE DISPLAY; HOWEVER, THE WORST CASE WOULD ASSUME THERE IS NOT

SUFFICIENT LIGHTING.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-486	NASA DAT. BASELIN NE	
SUBSYSTEM: MDAC ID: ITEM:	EMU 486 DCM ELECTRONICS	S (ITEM 350)	
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICAL: FLIGHT		ANCY SCREENS	CIL
HDW/FU		В С	ITEM
NASA [/ IOA [2 /2] []] [P]	[] [] [P]	[] * [x]
COMPARE [N /N] [N]	[N] [N]	[N]
RECOMMENDATIONS:	(If different	from NASA)	
[2 /1R] [P]		[A] ADD/DELETE)
* CIL RETENTION F	RATIONALE: (If a		
DEMARKS.		ADEQUATE INADEQUATE	[]
FMEA AND CIL. TH	IE IOA HAS UPGRA	THIS FAILURE MODE IN ADED THE CRITICALITY FUNCTION FAILURE WHI	TO REFLECT A

NASA DATA:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-487	NASA DATA: BASELINE NEW	[]		
	EMU 487 DCM ELECT	RONICS (ITEM 350))	
LEAD ANALYST:	G. RAFFAE	LLI			
ASSESSMENT:					
CRITICAL: FLIGH			Y SCREENS		CIL ITEM
HDW/FU	NC A	•	В	С	
NASA [/ IOA [2 /2] [] [P] [] [P] [p]	[
COMPARE [N /N] [N] [и][N]	[N]
RECOMMENDATIONS:	(If dif	ferent f	rom NASA)	
[2 /1R] [P	·] [F] [P] (AI	[A] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If app		ADEQUATE NADEQUATE	[]
REMARKS: THE IOA RECOMMEN FMEA AND CIL. T POSSIBLE CONCURR	HE IOA HAS	UPGRADE	IIS FAILU D THE CR	RE MODE INT	TO THE NASA TO REFLECT A

IN LOSS OF LIFE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-488	NASA DATA: BASELINE NEW	[]								
SUBSYSTEM: MDAC ID: ITEM:	EMU 488 DCM ELECTRONICS (ITEM 350))									
LEAD ANALYST:	G. RAFFAELLI										
ASSESSMENT:											
CRITICALI FLIGHT		rs	CIL								
HDW/FUN		ITEM									
NASA [/ IOA [2 /1R] [] [] [] [P] [P] [P]	[
COMPARE [N /N] [N] [N] [и ј	[N]								
RECOMMENDATIONS:	(If different from NASA)									
[2 /1R] [P] [F] [[A] D/DELETE)								
* CIL RETENTION R	ATIONALE: (If applicable)	10000000	_								
REMARKS:	I	ADEQUATE NADEQUATE	[]								
REMARKS: THE IOA RECOMMENDS INCLUSION OF THIS FAILURE MODE INTO THE NASA FMEA AND CIL. THE IOA WOULD ALSO MODIFY THE EFFECTS TO IDENTIFY A POSSIBLE CONCURRENT CO2 CONTROL FUNCTION FAILURE WHICH CAN RESULT IN LOSS OF LIFE.											

ASSESSMEN ASSESSMEN NASA FMEA	T ID		12/10/ EMU-49						ASA DAT BASELIN NI	1E	[]
SUBSYSTEM MDAC ID:	:		EMU 496 DCM E	LECTR	ONICS	;						
LEAD ANAI	LYST:		G. RA	FFAEI	TI							
ASSESSMEN	1T:											
(CRITI			RE	EDUNDA	MCA	SCREE	ens			CIL ITEM	I
		JIGH V/FU		A		В		C				
NASA IOA	[3	/]	[]	[]	[]		[] *
COMPARE	[N	/N]	[1	ſ]	[1		[]
RECOMMEN	DATIC	ons:	(If	dif	feren	t fr	om NAS	SA)				
	[3	/3]	ĺ]	[]	[]	(AI	[D/D] ELETE)
* CIL RE	TENT:	ION	RATION	ALE:	(If	appl	icabl	4	ADEQUAT ADEQUAT		[]
REMARKS: THE IOA FMEA.	RECO	MMEN	DS INC	LUSI	ON OF	THI	S FAI	LUR	E MODE	IN	THE	NASA

ASSESSMI ASSESSMI NASA FMI	ENT	'I	D:	12/10 EMU-5								NASA BASE		[]	
SUBSYSTE MDAC ID:				EMU 509 EVC												
LEAD ANA	LY	ST	:	G. RA	FF	ΑE	LLI									
ASSESSME	ENT	:														
	CR		ICAL: LIGH'	ITY r		R	EDUN	DAN	CY	sc	CREENS			CII		
]			NC		A			В		(2		ITE	M	
NASA IOA	[3	/ /2R]	[[P]	[P]] []	P]		[]	*
COMPARE	ſ	N	/N]	[N]	[N]	[]	1]		[]	
RECOMMEN	DA?	ric	ONS:	(If	d:	ifi	fere	nt i	fro	om	NASA)					
	[/]	[]	[]	[]	(AD	[D/D] ELE	TE)
* CIL RE	TEN	T	ON F	ATIONA	LE	:	(If	app	li	.ca		_				
REMARKS:											INA	DEQUA DEQUA	TE		_	
THE DETAIL IN THE IC DUE TO AN	J.	\sim	ишион	ICATIO	N	: Δ	י נוא	אמטיו	יצאי	NC	/ C C m \	DDDA				

NOT ENCOMPASSED AND SUBSEQUENTLY THE NASA FMEAS WERE FOUND TO

BE UNAVAILABLE.

ASSESSMEN ASSESSMEN NASA FMEA	T T			10/8 <i>6</i> -510	5							SA D BASEL		-]
SUBSYSTEM MDAC ID: ITEM:	ſ:		EMU 510 EVC												
LEAD ANAI	LYST	!:	G. 1	RAFF!	ÆΙ	LLI									
ASSESSMEN	T:														
(CICAL			RI	EDUNI	DANC	CY	SCR	EENS				CIL	
	_	LIGH' W/FU			A			В			С				•
NASA IOA	[3	/ /2R]]	P]	[P]]	P]		[] *
COMPARE	[N	/N	3	[N]	[N]	[N]		[]
RECOMMENI	DATI	ons:	(If d	ifi	fere	nt i	fro	n mc	IASA)					
	[/]	[]	[]	[]	(AI	[DD/D] ELETE)
* CIL RE	rent	CION	RATI	ONAL	€:	(If	apı	pl:	icak	ole) IN	AI IAI	DEQU <i>I</i>	ATE ATE	[]
REMARKS: THE DETA	ILEI	ANA	LYSE	S AN	D 2	ASSE	SSM	EN'	rs i	FOR I	H		J EV	C SH	

IN THE IOA COMMUNICATIONS AND TRACKING (C&T) REPORTS. HOWEVER, DUE TO AN ERROR OF OMISSION DURING THE C&T ANALYSIS, THE EVC WAS NOT ENCOMPASSED AND SUBSEQUENTLY THE NASA FMEAS WERE FOUND TO

BE UNAVAILABLE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		EMU-511 BASELINI NET									
MDAC ID:	EMU 511 EVC										
LEAD ANALYST:	G. RAFF	AELLI									
ASSESSMENT:											
CRITICAL: FLIGHT	ens	CIL ITEM									
	NC .	A	В	С	1154						
NASA [/ IOA [3 /2R] [p]	[] [P]	[] [P]	* []						
COMPARE [N /N] [N]	[и]	[N]	[]						
RECOMMENDATIONS:	(If di	ifferent	from NA	SA)							
[/] []	[]		[] DD/DELETE)						
* CIL RETENTION F	RATIONALE	E: (If ap	pplicable	•							
				ADEQUATE INADEQUATE	[]						
REMARKS: THE DETAILED ANALYSES AND ASSESSMENTS FOR THE EMU EVC SHOULD BE TO THE IOA COMMUNICATIONS AND TRACKING (C&T) REPORTS. HOWEVER, TO AN ERROR OF OMISSION DURING THE C&T ANALYSIS, THE EVC WAS											

NOT ENCOMPASSED AND SUBSEQUENTLY THE NASA FMEAS WERE FOUND TO

REPORT DATE 02/25/88 C-44

BE UNAVAILABLE.

ASSESSMEN ASSESSMEN NASA FMEA	T	II			/10/ U-51		5						N		DATA ELINE NEW	[]	
SUBSYSTEM MDAC ID:	M:			EM 51 EV	2													
LEAD ANA	LYS	ST	:	G.	RAF	F	ÆI	LLI										
ASSESSMEN	T	:																
C	CR:		ICAL:		•		RI	EDUNI	DAN	CY	sc	REEN	S			CII		
	1		W/FU				A			В			C	3				
NASA IOA	[3	/ /2R]		[P]	[P]	[]	I)		[]	*
COMPARE	[N	/N]		[N]	(N]	(ì	1]		[]	
RECOMMEN	DA'	TI	ons:		(If	d :	if	fere	nt	fr	om	NASA	7)					
	[/]		[3	(]	[]	(A	[.DD/I] DELE	TE)
* CIL RE	TE	ΝT	ION	RAI	NOI	AL:	E:	(If	aŗ	pl	ica		1		UATE UATE]	
REMARKS:								ACCE	CCL	rwat	mс				MII EX	_	TITOL	ום ח.

THE DETAILED ANALYSES AND ASSESSMENTS FOR THE EMU EVC SHOULD BE IN THE IOA COMMUNICATIONS AND TRACKING (C&T) REPORTS. HOWEVER, DUE TO AN ERROR OF OMISSION DURING THE C&T ANALYSIS, THE EVC WAS NOT ENCOMPASSED AND SUBSEQUENTLY THE NASA FMEAS WERE FOUND TO BE UNAVAILABLE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-513	5		NASA DATA BASELINE NEW	[]
MDAC ID:	EMU 513 EVC				
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICALI FLIGHT		REDUNDA	ANCY SCRE	ENS	CIL
HDW/FUN		A	В	С	ITEM
NASA [/ IOA [3 /2R] [P]	[[] [P]	[] *
COMPARE [N /N] [N]	[и]		[]
RECOMMENDATIONS:	(If di	.fferent	from NAS	SA)	
[/] []	Ĺĺ	[] (A	[] DD/DELETE)
* CIL RETENTION R	RATIONALE	: (If a	applicable		_
****				ADEQUATE INADEQUATE	[]
REMARKS: THE DETAILED ANAL IN THE IOA COMMUN DUE TO AN ERROR O NOT ENCOMPASSED A BE UNAVAILABLE.	ICATIONS F OMISSI	AND TR	RACKING (C ING THE CA	R THE EMU EVO C&T) REPORTS RT ANALYSIS.	C SHOULD BE . HOWEVER, THE EVC WAS

ASSESSME ASSESSME NASA FME	NT	ID			/10/8 J - 51								1		SA DA' ASELI N		[]		
SUBSYSTE MDAC ID:	M:			EMI 51	4															
LEAD ANA	LYS	ST:	:	G.	RAF	FA	EL	LI												
ASSESSME	NT:	:																		
	CR		CAL				RE	DUND	ANO	CY	SC	REE	NS				CIL			
	1		LIGHT N/FUI				A			В				С						
NASA IOA	[3	/ /2R]		[P]	[P]		[[P]		[]	*	
COMPARE			/N				N		[[(]		
RECOMME	NDA	TI	ons:		(If	đ	if:	feren	it	fr	om	NAS	A)							
	[/]		[]	(]		[]	(A	[DD/E	ELI	ETE))
* CIL R	ETE	NT	ION	RAT	TION	ĄL	E:	(If	ap	pl	ica	able			DEQUA' DEQUA']		
REMARKS	:											707		T1T T	e emi	E77	C CI	ı∪ı.	ר.ח	BF

THE DETAILED ANALYSES AND ASSESSMENTS FOR THE EMU EVC SHOULD BE IN THE IOA COMMUNICATIONS AND TRACKING (C&T) REPORTS. HOWEVER, DUE TO AN ERROR OF OMISSION DURING THE C&T ANALYSIS, THE EVC WAS NOT ENCOMPASSED AND SUBSEQUENTLY THE NASA FMEAS WERE FOUND TO BE UNAVAILABLE.

ASSESSMENT ASSESSMENT NASA FMEA	ID:	12/10 EMU-5						SA DATA ASELINI NEV]	
SUBSYSTEM: MDAC ID: ITEM:		EMU 515 EVC									
LEAD ANALYS	ST:	G. RA	FFAE	LLI							
ASSESSMENT:											
	TICAL] FLIGHT	יַ	R	EDUN	DANC	Y SCF	REENS		CII		
H	DW/FUN	ic	A	•	I	3	С		111	21.1	
] ARAM] AOI	/ 3 /2R]	[[P]] [])	[] [P]		[]	*
COMPARE [n /n]	[]]	[1	1]	[N]		[]	
RECOMMENDAT	ions:	(If	dif	ferer	nt fr	om N	ASA)				
	/]]	•	(A)	[DD/D] ELE'	re)
* CIL RETENT	rion R	ATIONA	LE:	(If	appl	icab		0773 @@	_		
REMARKS:							INADE	QUATE QUATE	-]	
THE DETAILED IN THE IOA OF TO AN ENDOTE OF TO THE NOT ENCOMPASSE UNAVAILABLE	ROR OF	F OMTS	NO P	מוזט ז ת מא <i>ד</i>	RACK	ING	(C&T) RI	EPORTS.	H	ZWE!	/ER,

ASSESSME ASSESSME NASA FME	TN	II			/10/ W-51		5								DATA: LINE NEW	[]
SUBSYSTE MDAC ID: ITEM:				EM 51 EV	.6												
LEAD ANA	'LY:	ST	:	G.	RAI	FF	ΑEΙ	LLI									
ASSESSME	INT	:															
	CR		ICAI		?		RI	EDUNE	ANO	CY	SCRE	EN	S			CIL	M
	FLIGHT HDW/FUNC					A							С				•
NASA IOA	[3	/ /2F]		[P]	[P]	[P]		[] *
COMPARE	[N	/N]		[N]	(N]	[N]		[]
RECOMMEN	IDA'	TI	ons:	:	(If	d :	ifi	ferer	nt :	fro	om NA	SA)				
	[/]		[]	[]	[]	(A)	[DD/D] ELETE)
* CIL RI		NΤ	ION	RAT	CION	AL	E:	(If	ap	p1 :	icabl				ATE ATE	[]
REMARKS	í																

THE DETAILED ANALYSES AND ASSESSMENTS FOR THE EMU EVC SHOULD BE IN THE IOA COMMUNICATIONS AND TRACKING (C&T) REPORTS. HOWEVER, DUE TO AN ERROR OF OMISSION DURING THE C&T ANALYSIS, THE EVC WAS NOT ENCOMPASSED AND SUBSEQUENTLY THE NASA FMEAS WERE FOUND TO BE UNAVAILABLE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/8 EMU-517			NASA DATA BASELINE NEW	
	EMU 517 ANTENNA				
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICALI FLIGHT		REDUNDA	NCY SCREE	ens	CIL
HDW/FUN	-	A	В	С	ITEM
NASA [/ IOA [3 /2R] [P]	[] [P]	[] [P]	[] *
COMPARE [N /N] [n]	[N]	[N]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[/] []	[]		[] DD/DELETE)
* CIL RETENTION F	RATIONALI	E: (If a	pplicable		_
REMARKS:				ADEQUATE INADEQUATE	[]
THE DETAILED ANAI IN THE IOA COMMUN DUE TO AN ERROR O NOT ENCOMPASSED A BE UNAVAILABLE.	ICATIONS F OMISSI	S AND TR CON DURI	ACKING (C	&T) REPORTS	. HOWEVER,

NASA DATA:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	NASA DATA: BASELINE NEW	[]								
SUBSYSTEM: MDAC ID: ITEM:	EMU 604 WATER LINE AND V	ENT TUBE ASSMEBLY								
LEAD ANALYST:	J. WHITMAN									
ASSESSMENT:										
CRITICAL		CY SCREENS	CIL ITEM							
FLIGH HDW/FU		ВС	11111							
NASA [/ IOA [2 /1R] [] [] [P] [] [] P] [P]	[] * [x]							
COMPARE [N /N] [N][n] [n]	[N]							
RECOMMENDATIONS:	(If different	from NASA)								
[2 /2] [] [[] [IA)	[A] DD/DELETE)							
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []										
REMARKS: THE IOA RECOMMENDS INCLUSION OF THIS FAILURE MODE INTO THE NASA ANALYSIS AT A 2/2 CRITICALITY TO REFLECT DEGRADED COOLING EFFECTS ON MISSION.										

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-612										
SUBSYSTEM: MDAC ID: ITEM:	EMU 612 HARD UPPE	R TORSO	SHELL								
LEAD ANALYST:	J. WHITMAN	4									
ASSESSMENT:											
CRITICALI FLIGHT		EDUNDANC	Y SCREE	NS	CIL						
HDW/FUN		1	В	С	ITE	M					
NASA [/ IOA [2 /2] [] [] [[x] *]					
COMPARE [N /N] [] [) (.]	[N]					
RECOMMENDATIONS:	(If diff	erent f	com NASA	A)							
[2 /2] [] [] [[] (AI	[A DD/DI] ELETE)					
* CIL RETENTION F	RATIONALE:	(If appl	licable)	ADEQUATE	ſ	1					
REMARKS:			I	NADEQUATE	<u>[</u>	j					
THE IOA RECOMMEND FMEA AND CIL. TH PINS.	S INCLUSIONE IOA WOUL	N OF THI	S FAILU AUSES OF	RE MODE INT CONTAMINAT	TO TH	HE NASA AND BENT					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-616		1	BASELINE NEW]	
MDAC ID:	EMU 616 BODY SEAL	RE (H	UT SID	E)			
LEAD ANALYST:	J. WHITMAN	ı					
ASSESSMENT:							
CRITICAL		EDUNDAI	NCY S	CREENS		CIL ITEN	ſ
FLIGH' HDW/FU	NC A		В		С		
NASA [/ IOA [2 /2] []	[]] []	[x] *
COMPARE [N /N] []	[]	[]	[N	1
RECOMMENDATIONS:	(If dif:	ferent	from	NASA)			
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* CIL RETENTION	RATIONALE:	(If a	pplic	cable) IN	ADEQUATE ADEQUATE	[]
REMARKS: UPON FURTHER REV MODE FROM THE IC	TEW, THE I	OA REC	OMMEN O ITS	NDS DEI BEING	ETION OF NON CREI	THIS DIBLE	FAILURE

ASSESSMI ASSESSMI NASA FMI	CNT	Ι	ATE D:		10/86 -617					NASA I BASEI		[
SUBSYSTE MDAC ID:				EMU 617 BOD		. CL	SURE	(HU	T SID	E)				
LEAD ANA	LYS	ST	:	J.	WHITMA	.N								
ASSESSME	NT	:												
	CRI		ICA LIG	LITY HT	R	EDUN	IDANCY	SCI	REENS			CII	_	
	ŀ	łDi	W/F	UNC	A		E	3	(2		ITE	.M	
NASA IOA	[2	/ /2]]	[[]	[[]	[]		[[X]	*
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RECOMMEN	DAT	'IC	ONS	: (1	f dif	fere	nt fr	om N	IASA)					
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* CIL RE	ren	TI	ON	RATIO	NALE:	(If	appl	icab	le)					
REMARKS:									INA	DEQUAT	re	[]	
UPON FURT MODE FROM	THE	R HE	RE	/IEW, DA ANA	THE IC	DAR DUE	ECOMMI	ENDS	DELE	TION C	OF TI	HIS	FA	ILURE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-618	NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 618 BODY SEAL CLOSURE (HUT SI	DE)	
LEAD ANALYST:	J. WHITMAN		
ASSESSMENT:			
CRITICAL: FLIGHT	CIL ITEM		
	NC A B	С	
NASA [/ IOA [1 /1] [] [] []]	F]	[x] *
COMPARE [N /N] [N] [N]	[и]	[N]
RECOMMENDATIONS:	(If different from NAS	A)	
[/] [] []	[] (AI	[] DD/DELETE)
* CIL RETENTION	RATIONALE: (If applicable) ADEQUATE INADEQUATE	
REMARKS: UPON FURTHER REV MODE FROM THE IO DETERMINED NON-C	TIEW, THE IOA RECOMMENDS DO A ANALYSIS. THE ORIGINAL REDIBLE.	ELETION OF T ANALYSIS HA	THIS FAILURE AS BEEN

ASSESSMI ASSESSMI NASA FMI	ENT	' I		12/10 EMU-6					N	IASA [BASE]		[]]	
SUBSYSTE MDAC ID:				EMU 675 ROLLO	n cu	JFF									
LEAD ANA	YLY	ST	:	J. WH	ITMA	AN .									
ASSESSME	ENT	:													
	CR		ICAL LIGH	ITY	R	EDUN	DANCY	SCF	REENS			CI			
			W/FU	_	A		E	3	C	!		LT.	EM		
NASA IOA	[2	/2]	[]	[]	[]		[:	y]	*	
COMPARE	[N	/N]	[]	[]	[]		[]	N]		
RECOMMEN	DA'	ΓΙC	ons:	(If	dif	fere	nt fr	om N	IASA)						
	[2	/2]	[]	[]	[]	(AD)		A] DEL		:)
* CIL RE	TE	(TN	ON 1	RATION	ALE:	(If	appl	icab							
REMARKS:										DEQUA' DEQUA']		
THE IOA FMEA AND	RE(CON	MENI	OS INCI	LUSI	ON OI	F THI	S FA	ILURE	MODE	INTO	נ כ	ГНЕ	NA	SA

ASSESSME ASSESSME NASA FME	ENT	I		12/10/ EMU-67						ASA DA' BASELII N		[]	
SUBSYSTE MDAC ID:				EMU 676 VALVE											
LEAD ANA	LY	ST	:	J. WH	IAMTI	N									
ASSESSME	ENT	:													
	CR		ICAL LIGH		R	EDUNDA	ANCY	SCRE	ENS			CI	L EM	r	
	1		W/FU		A		В		С				, EP	L	
NASA IOA]	2	/ /2]	[[]	[]	[]		[x]	*
COMPARE	[N	/N]	[]	[j	[]		[N]	
RECOMMEN	IDA'	ΓΙ	ons:	(If	dif:	ferent	t fr	om NAS	SA)						
	[2	/2]	[]	[]	[]	(AD		A DE		ETE)
* CIL RE	ETE	NT:	ION :	RATION	ALE:	(If a	appl	icable	•		_	_			
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REMARKS: THE IOA FMEA ANI	RE			DS INC	LUSI	ON OF	THI	S FAI	LURE	MODE :	INI	'O	TH	ΙE	NASA

ASSESSME ASSESSME NASA FME	NT	I		12/10 EMU-6					N	IASA D BASEL		[]	
SUBSYSTE MDAC ID:				EMU 677 BLADD	ER										
LEAD ANA	LY	ST	:	J. WH	ITMA	N									
ASSESSME	NT	:													
	CR		ICAL LIGH	ITY T	F	REDUN	DANCY	SCR	REENS				IL PEM	4	
				NC	A		E	3	C	:		-		•	
NASA IOA	[2	/ /2]]]	[]	[]]	x]	*
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* CIL RE	TE	NT:	ION :	RATION	ALE:	(If	appl	icab		DE0113				_	
DEMI DVC -										DEQUA'		[]	
REMARKS: THE IOA FMEA AND				DS INC	LUSI	ON O	F THI	S FA	ILURE	MODE	INT	' O	TH	ΙE	NASA

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/8 EMU-678	6			NASA I BASEI		[]	
SUBSYSTEM: MDAC ID: ITEM:	EMU 678 BLADDER	ł.								
LEAD ANALYST:	J. WHIT	MAN								
ASSESSMENT:										
CRITIC		REDUND	ANCY	SCREEN	IS		CI	L EM	i	
FLIC HDW/I		A	В		С					
NASA [/ IOA [2 /] []	[] [[X]	*
COMPARE [N /	4] []	[]	[]		[N]	
RECOMMENDATION	S: (If d	differen	t fro	m NASA	A)					
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* CIL RETENTIO	N RATIONAI	LE: (If	appli) ADEQUA INADEQUA		[]	
REMARKS: THE IOA RECOMM FMEA AND CIL.	ENDS INCL	JSION OF	THIS	FAIL	URE MOD	E IN'	ro	Tł	ΙE	NASA

ASSESSMI ASSESSMI NASA FMI	ENT	I	ATE:		/10/86 U-679	5			1	NASA D BASEL		-	
SUBSYSTE MDAC ID:				EM 679 HA									
LEAD ANA	LY	ST	:	J.	WHITM	IAN							
ASSESSME	NT	:											
	CR		ICAI LIGH			REDUN	DANC	SCF	REENS			IL TEM	
]	HD	W/FU	NC		A	I	3	C	2	•	LLI	
NASA IOA	[[2	/ /2]] []]	[]	[]	[x]	*
COMPARE	[N	/N]	[]	ĺ]	[]	C	N]	
RECOMMEN	DA'	ric	ons:	((If di	ffere	nt fr	om N	IASA)				
	[2	/2]	Į.]	[]	[3	[ADD,	A] /DEL	ETE)
* CIL RE	TEI	NT]	ION	RATI	ONALE	: (If	appl	icab	A	DEQUA]	
REMARKS: THE IOA FMEA AND	REC	CON	I MEN	DS I	NCLUS	ION O	F THI	S FA		_	•	THE	NASA

ASSESSME ASSESSME NASA FME	NT	II		12/10 EMU-0	-					ASA DA BASELI 1	NE	[]	
SUBSYSTE MDAC ID:				EMU 680 CCA											
LEAD ANA	LYS	ST	:	J. W	HITMA	M									
ASSESSME	:TN	:													
	CR:		ICAL LIGH		F	REDUN	DANCY	sci	REENS			CI	L		
	1	_	W/FU		A	\	В		С						
NASA IOA	[2	/ /2]	[]]]]]		[x]	*
COMPARE	[N	/N]	[]	[]	[]		[N]	
RECOMMEN	IDA!	ΓI	ons:	(I:	f dif	fere	nt fro	om 1	NASA)						
	[2	/2]	[]	[]	[]	(AI		A DE		TE)
* CIL RE	TE	NT:	ION	RATIO	NALE:	(If	appl	ical		DEQUAT	ГE	r		1	
										DEQUA		į]	
REMARKS: THE IOA	RE			DS IN	clusi	ои о	F THIS	5 F	AILURE	MODE	INT	.O	TH	E	NASA

ASSESSME ASSESSME NASA FME	ENT	I		12/10/ EMU-68						NASA D BASEL		[]
SUBSYSTE MDAC ID:				EMU 681 CCA									
LEAD ANA	LY	ST	:	J. WHI	TMA	1							
ASSESSME	NT	:											
	CR		ICALI LIGHT	TY	RI	EDUNDA	NCY	SCRE	ENS	}		CIL	
	1			iC	A		В			С		ITE	1
NASA IOA	[3	/ /2R]	[]	[]	[]		[] *
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RECOMMEN	IDA!	ΓI	ons:	(If	difi	ferent	fro	om NAS	SA)				
	[3	/2R	1	[P]	[P]	[P]	(AI	[DD/DI] ELETE)
* CIL RE	TEI	T.	ION F	RATIONA	LE:	(If a	ıppl i	.cable	·	ADEQUA ADEQUA]]
REMARKS: THE IOA FMEA.	REG	COI	MENI	s inci	usic	ON OF	THIS	FAII				•	IE NASA

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-742X		NASA DA BASELI N		
SUBSYSTEM: MDAC ID: ITEM:	EMU 742 SHEATH ASSI	EMBLY (ITE	M 428)		
LEAD ANALYST:	G. RAFFAEL	LI			
ASSESSMENT:					
CRITICA FLIG		DUNDANCY S	CREENS	CIL ITEM	
HDW/F		В	С		
NASA [/ IOA [3 /3] [] [P] []] [P]	[] [P]	[]	*
COMPARE [N /N] [N] [и]	[N]	[]	
RECOMMENDATIONS	(If diff	erent from	NASA)		
[3 /3] [] []	[]	[] (ADD/DEI	ETE)
* CIL RETENTION	RATIONALE:	(If applio	able) ADEQUAT	re []	
			INADEQUAT		
REMARKS: THE IOA RECOMMENTALYSIS.	NDS INCLUSIO	N OF THIS	FAILURE MODE	INTO THE	NASA

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-803X			NASA DATA BASELINE NEW	[]
MDAC ID:	EMU 803 NECK RIN	IG AND V	VENT SEAL	ASSEMBLY	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICALI FLIGHT		REDUNDA	NCY SCREE	ens	CIL
HDW/FUN	-	A	В	С	ITEM
NASA [/ IOA [3 /2R] [P]	[] [F]	[] [P]	[
COMPARE [N /N] [n j	[N]	[N]	[N]
RECOMMENDATIONS:	(If di	fferent	from NAS	SA)	
[3 /2R] [P]	[F]	[P] (A)	[A] DD/DELETE
* CIL RETENTION F	RATIONALE	: (If a	pplicable	•	
				ADEQUATE INADEQUATE	[]
REMARKS: THE IOA RECOMMEND MISSION IMPACTS F LOOSE TMG IN THIS	ROM HOT/	COLD SP	ALITY TO	ACCOUNT FOR CAN RESULT	POSSIBLE FROM THE

ASSESSMEN ASSESSMEN NASA FMEN	T	ID		8/06/ EMU-8	/87 305X					ASA D BASEI		-]		
SUBSYSTEM MDAC ID:	M:			EMU 805 BODY	SEAL	CLOS	URE	(HUT	HALF	')					
LEAD ANA	LYS	ST:		G. R	AFFAE	LLI									
ASSESSME	NT:	}													
,	CRI		CAL		R	EDUNI	DANCY	SCR	EENS			CII			
	I		JIGH V/FU		A		E	3	C	2					
NASA IOA	[2	//2]	[]	[]]	[]		[]	K]	*
COMPARE			/N		[]	[]	Į.]		[]	N]	
RECOMMEN	DA'	TI	ons:	(I	f dif	fere	nt fi	com N	IASA)						
	[2	/2]	[]	[1	[]	(A	DD/	A DE] LE	ETE)
* CIL RE	TE	NT	ION	RATIO	NALE:	(If	app:	licak	4	ADEQU ADEQU		[]	
REMARKS: THE IOA IMPACTS	~ =	CO	MMEN LTIN	IDS A	2/2 (OM HO	CRITI T/COL	CALI' D SP	TY TO	REF	LECT MAY	POSS ACCO	IBL MPA	E NY	CM C	SSION THIS

FAILURE MODE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-813X			NASA DATA BASELINI NEV	
	EMU 813 UPPER/LOW	VER ARM	RESTRAIN	VT AND BLADE	DER ASSEMBLY
LEAD ANALYST:	G. RAFFAE	ELLI			
ASSESSMENT:					
CRITICALI FLIGHT	TY F	EDUNDAN	CY SCREE	ens	CIL
HDW/FUN			В	С	ITEM
NASA [/ IOA [2 /2] [] []	[]	[] * [x]
COMPARE [N /N] [) []	[]	[N]
RECOMMENDATIONS:	(If dif	ferent :	from NAS	A)	
[2 /2] [] []		[A] DD/DELETE)
* CIL RETENTION R	ATIONALE:	(If app	plicable		
REMARKS:				ADEQUATE ADEQUATE	[]
THE IOA CONSIDERE RESULT IN SUFFICI TERMINATION. THE	CNI CREWPI	ERSON DI	SCOMPODI	P MA ANTIAN 1	/TOOTAL

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-820X	ζ			SA DATA: ASELINE NEW	•
0000101	EMU 820 RESTRAIN	T MODIF	IED			
LEAD ANALYST:	G. RAFF	AELLI				
ASSESSMENT:						
CRITICAL		REDUNDA	NCY SC	REENS		CIL
FLIGH HDW/FU		A	В	С		
NASA [/ IOA [2 /2] []	[]	[[]	[x] *
COMPARE [N /N] []	[]	ſ]	[N]
RECOMMENDATIONS:	(If d	ifferent	from	NASA)		
[2 /2] [1	[]	[] (AI	[A] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplica	AL	DEQUATE DEQUATE	[]
REMARKS: THE IOA CONSIDER CAUSING SUFFICIE TERMINATED. THE INCLUSION IN THE	INT CREW IOA THE	DISCOMFC REFORE F	112'1' 'I'M/	A'I 1 M C I	ITOSTON .	T C

ASSESSM ASSESSM NASA FM	ENI	' I	D:	: 8/06 EMU-	5/87 -825X					NASA I BASEI]]	
SUBSYST				EMU 825 WAIS	ST RE	STRA:	INT A	ND B	LADDE	R				
LEAD AND	ALY	ST	:	G. R	AFFA:	ELLI								
ASSESSMI	ENT	:												
	CR	IT F	ICAI LIGI	LITY IT]	REDUN	VDANC!	Y SCI	REENS			CIL		
				JNC	1	A	I	3		С		ITE	M	
NASA IOA	[2	/ /2]	[]	[]	[]		[x]	*
COMPARE	[N	/N]	[]	[]	[]		[N	J	
RECOMMEN	DA:	ric	ons:	(I	f dif	fere	nt fr	om N	ASA)					
	[2	/2)	[]	[]	[]	(AI	[A DD/D		TE)
* CIL RE	TE	ľ	ON	RATIO	NALE:	(If	appl	icab						
REMARKS:									INA	ADEQUA'	ΓE]	
BECAUSE CREWPERS DEFORMAT POSSIBLE	ON ION	נע נע	SCO. THE	MFORT IOA I	DUE RECOM	TO E	ΧΈΡΦΤ	ON T	O OTTE	DCOME	MITT:	D D C	~~~	TANI T

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DATA BASELINE NEW	[]
	EMU 826 WAIST REST	TRAINT AN	D BLAD	DER	
LEAD ANALYST:	G. RAFFAEI	LLI			
ASSESSMENT:					
CRITICAL: FLIGH	ITY RI	EDUNDANCY	SCREE	NS	CIL ITEM
HDW/FU		В		С	
NASA [/ IOA [2 /2] [] [] []	[]	[
COMPARE [N /N] [] [3	[]	[N]
RECOMMENDATIONS:	(If dif	ferent fr	om NAS	A)	
[2 /2] [] [1	[] (A)	[A] .DD/DELETE)
* CIL RETENTION	RATIONALE:	(If appl) ADEQUATE INADEQUATE	
REMARKS: PROBABLE HOT/COL DISCOMFORT AND M RECOMMENDS A 2/2	ISSION TER	MINATION.	THE	IOA, THEREF	ORE,

FAILURE MODE.

ASSESSMI ASSESSMI NASA FMI	ENT	II									DATA LINE NEW				
SUBSYSTE MDAC ID:				EMU 829 LOWE	R TOI	RSO R	ESTR <i>I</i>	AINT/	'BLAD	DER A	SSEMI	BLY			
LEAD ANA	LYS	T:	:	G. R	AFFAI	ELLI									
ASSESSME	NT:														
				ITY T	I	REDUN	DANC	SCR	REENS			CIL			
				NC	2	4	E	3	•	C		ITE	Μ		
NASA IOA	[2	/ /2]	[]	[]	[]		[x]	*	
COMPARE	[N	/N]	[]	[]	[]		[N]		
RECOMMEN	DAT	'IC	NS:	(If	dif	fere	nt fr	om N	ASA)						
	[2	/2	1	[]	[]	(]	(AI	[A DD/DI		TE)	
* CIL RE	TEN	ΤI	ON 1	RATION	ALE:	(If	appl	icab							
										ADEQU. ADEQU.	ATE ATE	[]		
REMARKS: THE IOA IN SIGNI THE IOA, THE CIL	FIC TH	AN ER	T CI EFOI	REWPER RE, RE	SON COMM	DISC ENDS	OMFOR	T AN	D MIS	STON	TERM	TNAT	חדי	N	

ASSESSME ASSESSME NASA FME	NΤ	I		8/06 EMU-	•					ASA I BASEI		[]	
SUBSYSTE MDAC ID: ITEM:	M:			EMU 834 PRES	SURE I	B001	r asse	MBL	Y						
LEAD ANA	LY	ST	:	G. R	AFFAEI	LLI									
ASSESSME	NT	:													
	CR:		ICAL LIGH	ITY	RI	EDUI	NDANCY	SCI	REENS			C)	[L [EM	ſ	
	1		W/FU		A		В		C	:				•	
NASA IOA	[2	/2]	[]]]	[]		[x]	*
COMPARE	[N	/N]	[]	[]	[]		[N]	
RECOMMEN	DA'	TI	ons:	(I	f dif	fere	ent fr	om 1	NASA)						
	[. 2	/2]	[]	[]	[]	(AI		A /DE		TE)
* CIL RE	TE:	NT	ION	RATIC	NALE:	(I:	f appl	ical	A	DEQU <i>I</i>]	
REMARKS: THE IOA FMEA/CIL		CO:	MMEN	DS IN	CLUSI	ON (OF THI	S F	AILURE	MODE	INT	07	TH	ΙE	NASA

SUBSYSTEM: EMU MDAC ID: 784 ITEM: PLSS	
LEAD ANALYST: G. RAFFAELLI	
ASSESSMENT:	
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM	
HDW/FUNC A B C	
NASA [2/2] [] [] [X] IOA [2/1R] [P] [F] [X]	*
COMPARE [/N] [N] [N] []	
RECOMMENDATIONS: (If different from NASA)	
[2/1R] [P] [F] [F] [] (ADD/DELE	TE)
* CIL RETENTION RATIONALE: (If applicable)	
ADEQUATE [] INADEQUATE []	
REMARKS: THE IOA RECOMMENDS A 2/1R BC CRITICALITY TO REFLECT THAT TH BRACKET IS ONE OF TWO WHICH IF BOTH WERE LOST CAN RESULT IN SEPARATION OF HUT FROM PLSS AND UNCONTROLLED DEPRESSURIZATI	

ASSESSMEN ASSESSMEN NASA FME	T	II		EM	06/8 U-78 0-FM	52	ζ.										DA ELI N		[]	
SUBSYSTEM MDAC ID:	4:			EM 78 PL	5																	
LEAD ANA	LYS	ST:	:	G.	RAF	F	ΑEΙ	LI														
ASSESSME	YT:	:																				
(CR]		CAL:				RI	EDUI	NDA	NC	Y	sc	REE	18						L EN	vī.	
	I		LIGHT V/FUI				A				В				С					. 1		
NASA IOA]	2 2	/1R /1R]		[P P]		[P P]	[[P P]]	X X]	*
COMPARE	(/]		[]		[]	1	[]			[)	
RECOMMEN	DA:	ric	ONS:		(If	đ.	if	fer	ent	: f	ro	o m	NASA	A)								
	[/]		[]		[]	1	[]		(A)] DD,	/DI	ELI ELI	ETE)
* CIL RE	ΓEI	N T :	ION I	RAI	ION	ΔL	Е:	(I	f a	pp	1:	ica					LAU LAU		[]	
THE IOA	AN!	D :	THE I	NAS	A AI	₹E	I	N A	GRE	EEM	ŒΙ	T.	1									

ASSESSMENT DATE: 8/06/87 ASSESSMENT ID: EMU-786X NASA FMEA #: 100-FM3															DA ELI N		[x]		
SUBSYSTE MDAC ID:				EM 78 PL	6																
LEAD ANA	LY	ST	:	G.	RAI	FF.	AE:	LLI													
ASSESSME	NТ	:																			
	CR:		ICAL: LIGH:				RI	EDU	NDA	NC	Y	SCF	REEN	S					IL PEM	1	
]	HDI	W/FUI	NC			A				В			С							
NASA IOA	[1 2	/1 /1R]]	P]	!	[[P]] [P]			[X X]	*
COMPARE	[N	/N]		[N]		[N]	£	N]			[]	
RECOMMEN	DA:	ΓΙ(ons:		(If	d:	ifi	fer	ent	f	rc	om N	IASA))							
	[/]		[]		[]	[]		(AI	[DD/	DE] LE	ETE)
* CIL RE	TEI	NT:	ION I	RAT:	IONA	LI	Ξ:	(I	f ap	gc	li	.cab	•			UAT: UAT:		[]	
UPON FUR	THI	ΞR	REV]	EW	THE		[O#	A	GREI	ES	W	ITH	тні	1 E	IAS.	A A	NAI	ιΥS	sis	•	

ASSESSMENT DATE: 8/06/87 ASSESSMENT ID: EMU-787X NASA FMEA #: 100-FM4														_		DAT ELIN		[x]	
SUBSYSTE MDAC ID: ITEM:	M:			EMI 78	7																
LEAD ANA	LYS	r:		G.	RAF	'F <i>I</i>	ÆΙ	LI													
ASSESSME	NT:																				
	CRITICALITY FLIGHT							REDUNDANCY SCREENS									CI	L CEN	Я		
		DM/					A			1	В			С					LEI	1	
NASA IOA		2 / 2 /]]	P P]		[]	F F]]	P P]			[X X]	*
COMPARE	[/]		3]		[]	[3			[]	
RECOMMEN	DAT	ION	s:		(If	d:	ifi	ere	ent	f	rc	om 1	NASA)							
	[/]		[]		[]	[]	ı	(AI] D/	/DI	ELI ELI	ETE)
* CIL RE	TEN'	TIO	N I	RAT	IONA	L	Ξ:	(II	fa	pp:	1 i	cal			-	TAU TAU		[]	
REMARKS: THE IOA	AND	TH	E I	NAS.	A AF	RΕ	I	1 A(GRE	EM:	ΕN	IT.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-840 101-FM1	X		NASA DATA BASELINE NEW	
	EMU 840 CCA				
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL FLIGH	T	ANCY SCRE		CIL ITEM	
HDW/FU	NC	A	В	С	
NASA [3 /2R IOA [3 /2R] [P] P]	[P] [P]	[P] [P]	[] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If d	ifferen	t from NA	SA)	
[/) []	[]	[] (A	[] DD/DELETE
* CIL RETENTION REMARKS: THE IOA AND THE				e) ADEQUATE INADEQUATE	[]

ASSESSMENT DATE: 8/06/8° ASSESSMENT ID: EMU-84° NASA FMEA #: 101-FM° SUBSYSTEM: EMU							ζ								DATA LINE NEW	[X]	
SUBSYSTI MDAC ID: ITEM:				EM 84 CC	2														
LEAD AND	ALYS	ST	:	G.	RAF	F	AEI	LLI											
ASSESSMI	ENT	:																	
	CR		ICAL:		?		RI	EDUN	DAN	CY	SCR	REEN	S			CI		Ī	
	1	_	W/FUI				A			В			С						
NASA IOA]	3	/2R /2R]		[P P]	[[P P]	[P P]		[[]	*
COMPARE	[/]		[]	[•]	[]]]	
RECOMME	NDA'	TI	ons:		(If	đ.	if:	fere	nt	fr	om N	IASA)						
	[/	3		[]	1	•]	[]	(A	[.DD/	DE] :LE	ETE)
* CIL R	ETE:	NT.	ION	RA'	ION	ΑL	E:	(If	aj	ppl	icak				JATE JATE	[]	
DEMADES																			

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-841 101-FM2	X		NASA DAT BASELIN NE							
SUBSYSTEM: MDAC ID: ITEM:	EMU 841 CCA										
LEAD ANALYST:	G. RAFF	AELLI									
ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM											
HDW/FUI		A	В	С	IIEM						
NASA [3 /2R IOA [3 /3] [P]	[P]	[P] []	[] *						
COMPARE [/N] [N]	[N]	[N]	[]						
RECOMMENDATIONS:	(If d	ifferent	from NA	ASA)							
[3 /3] []	[]	[] ([] ADD/DELETE)						
* CIL RETENTION F	RATIONALI	E: (If a	applicab]								
DEMARKS.				ADEQUATE INADEQUATE							
REMARKS: THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA RECOMMENDS A 3/3 CRITICALITY DUE TO NO MISSION OR CREWPERSON IMPACT.											

ASSESSME ASSESSME NASA FME	NТ	ID		EMU	06/87 U-868X U-FM3						DATA: LINE NEW	[
SUBSYSTEMDAC ID:	M:			EMU 868 CCA	3									
LEAD ANA	LYS	T:		G.	RAFFA	ELLI								
ASSESSME	NT:													
	CRI		CAL			REDUN	DANCY	SCR	EENS			CII		
	E		IGH /FU			A	В		C	2				
NASA IOA	[3	/3 /3]	[]	[]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	IDA'	ric	ons:		(If di	ffere	ent fr	om N	IASA)					
	[/]	[Ţ	ſ]	[]	(A	[DD/1) DET	ETE)
* CIL R	ETEI	NT]	ON	RAT	IONALE	: (I1	f appl	.icak	4		UATE UATE	[]	
REMARKS:	AN:	D :	THE	NAS	A ARE	IN A	GREEME	TNE						

ASSESSMI ASSESSMI NASA FMI	ENT	ID:	EMU	06/87 U-869X U-FM4				NASA DAT BASELIN NI		x]				
SUBSYSTI MDAC ID: ITEM:			EMU 869 CCA											
LEAD ANA	ALYS	T:	G.	RAFFA	ELLI									
ASSESSME	ENT:													
		CI												
	Н	DW/F	INC	j	A]	В	(C	ITEM				
NASA IOA	[3 /3 3 /3]	[]]]]]	[]	*		
COMPARE	[/]	[]	[]	[]	[)			
RECOMMEN	'DAT	IONS:	(:	If di	ffere	ent fi	com N	'ASA)						
	[/	.]	[]	ί]	[[ADD/I] DELE	TE)		
* CIL RE REMARKS: THE IOA								A	DEQUATE]			
					AG	Translati	174 T *							

ASSESSME ASSESSME NASA FME	NT :	ID:		870X				N		DATA: LINE NEW	[_	
SUBSYSTEMDAC ID:	M:		EMU 870 CCA										
LEAD ANA	LYS	r:	G. R	AFFAE	LLI								
ASSESSME	NT:												
	EENS			CII									
		FLIGH DW/FU	NC	A	Y	В		c	:				
NASA IOA	[;	2 /2 2 /2]	[]	[]	[]		[]	K]	*
COMPARE	[/]	[]	[]	[]		[)	
RECOMMEN	DAT:	ions:	(I	f dif	fere	nt fr	om N	ASA)					
	[/]	[]	[]	[]	(A)	[DD/1	DEL.	ETE)
* CIL RE	TEN'	TION	RATIO	NALE:	(If	appl	icab		ADEQU ADEQU	JATE JATE	[]	
REMARKS: THE IOA	AND	THE	NASA .	ARE I	IN AG	REEME	NT.						

ASSESSMENT ASSESSMENT NASA FMEA	ID:	12/10/8 EMU-601 102-FM1			NASA DATA BASELINI NEV	3 []
SUBSYSTEM: MDAC ID: ITEM:		EMU 601 NECK RI	NG AND	VENT SEAI	. ASSEMBLY	
LEAD ANALY	ST:	J. WHIT	MAN			
ASSESSMENT	? :					
	RITICAL: FLIGH: HDW/FU	r	REDUND.	ANCY SCRE	EENS C	CIL ITEM
NASA [IOA [2 /2 2 /2] [NA]	[] [AN]	[] [NA]	[X] *
COMPARE [/] [и ј	[N]	[N]	[]
RECOMMENDA	TIONS:	(If d	ifferen	t from NA	SA)	
C	/] []	[]	[] (A	[] ADD/DELETE
* CIL RETE REMARKS: THE IOA AN					e) ADEQUATE INADEQUATE	[]

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-611 102-FM10	NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM: MDAC ID: ITEM:	EMU 611 HARD UPPER	TORSO SHELL								
LEAD ANALYST:	J. WHITMAN									
ASSESSMENT:										
CRITICAL	NS	CIL ITEM								
FLIGH HDW/FU	_	В	С							
NASA [1 /1 IOA [2 /1R] [P] []] [P]	[] [P]	[X] * [X]						
COMPARE [N /N] [N] [N]	[и]	[]						
RECOMMENDATIONS:	(If diff	erent from NAS	A)							
[2 /1F	[P] [P]	[F] (A)	[] DD/DELETE)						
* CIL RETENTION	RATIONALE:	(If applicable	ADEQUATE	[]						

THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA BELIEVES SUCH A FAILURE MUST FIRST RESULT IN LOSS OF PLSS FUNCTION THEN LOSS OF SOP FUNCTION TO CAUSE LOSS OF LIFE. BECAUSE THE DEFINED FAILURE DOES NOT ENSURE THE IMMEDIATE LOSS OF PLSS AND SOP BUT RATHER THEIR LOSS AS A FUNCTION OF FAILURE SESVERITY DEFINITION. THE IOA RECOMMENDS A 2/1R CRITICALITY AND FAILURE OF SCREEN C TO

INDICATE THE LOSS OF LIFE SCENARIO.

ASSESSM ASSESSM NASA FM	ENT	, ID	:			NASA D BASEI] [x							
SUBSYST MDAC ID ITEM:				EMU 846 HAR	D TOR	50 S	HELL						-			
LEAD AN	ALY	ST:		G. 3	RAFFAI	ELLI										
ASSESSM	ENT	:														
	CALI [GHT		I	REDUI	NDANCY	SCF	REENS			CII	_					
]	HDW/	/FUN	С	I	7	E	В С					ITEM			
NASA IOA	[1 /	′1 ′1]	[]	[]	[]	ļ	X	() ()	*		
COMPARE	[/	•)	[]	[]	[]	[]			
RECOMMEN	IDA'I	CION	is:	(I	f dif	fere	ent fr	om N	ASA)							
	[/]	[]	[]	[]] (ADD)	/D] ELI	ETE.		
* CIL RE									A	LAUQUAI]			

ASSESSMENT DATE: 8/06/87 ASSESSMENT ID: EMU-847X NASA FMEA #: 102-FM12												SA DA ASELI N		[x]	
SUBSYSTEM MDAC ID: ITEM:	1 :		EMU 847 HARD	TOP	RSC	зні	ELI	ı									
LEAD ANAI	LYST	:	G. RA	FFA	AEI	LI											
ASSESSMEN	T:																
C	F	ICAL: LIGH: W/FUI	r		RE A	DUNI	DAN	CY B	SCR	EENS	c C			CI	L EM	Í	
NASA IOA	[3	/3 /3]	[P]	[P]]	P]		[]	*
COMPARE	[/]	[N]	(N]	[N]		[]	
RECOMMENI	DATI	ons:	(If	d :	iff	erei	nt	fr	om N	'ASA')						
	[/]	[3	(]	[]	(AI	[DD/	'DE] ELE	ETE)
* CIL RE	rent:	ION 1	RATION	IAL	Ε:	(If	aŗ	pl	icab			EQUAT EQUAT		[]	
REMARKS:																	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-848X		NASA DAT BASELIN NE							
SUBSYSTEM: MDAC ID: ITEM:	EMU 848 HUT ASSEME	BLY								
LEAD ANALYST:	G. RAFFAEI	LI								
ASSESSMENT:										
FLIGHT				CIL ITEM						
HDW/FUI	NC A	В	С							
NASA [3 /3 IOA [2 /2] [] [P] [F] []] [P]	[x] *						
COMPARE [N /N] [N] [N]] [N]	[N]						
RECOMMENDATIONS:	(If diff	erent from	m NASA)							
[2 /2] [] [:] [] ([A] ADD/DELETE)						
* CIL RETENTION I	RATIONALE:	(If applie	-							
	ADEQUATE [] INADEQUATE []									
REMARKS: THE IOA ASSUMED THE WORST CASE WHERE THE DISLODGED ITEM POSITIONS ITSELF IN A MANNER WHICH IMPAIRS CREWPERSON VISION OR MOBILITY. THE IOA THEREFORE RECOMMENDS A 2/2 CRITICALITY AND INCLUSION IN THE CIL FOR THIS FAILURE MODE										

REPORT DATE 02/25/88 C-86

ASSESSMEN ASSESSMEN NASA FME	T.	D:		EMU	06/8 J-84 2-FM	9 X										DAT ELIN NE	ΙE	[]	K]	
SUBSYSTEM MDAC ID:	M:			EMU 849 HU		SE	EME	LY													
LEAD ANA	LYS	r:		G.	RAF	F	ΈI	LI													
ASSESSME	NT:																				
	CRI'						RE	DUN	IDAI	NC	Y	SCR	EENS	5				CI		1	
			IGH /FU				A				В			С							
NASA IOA	[1	/1 /1]		[P]		[F]]	P]			[X X]	*
COMPARE	[/]		[N]		[N]	[N]			[]	
RECOMMEN	DAT	10	ns:		(If	đ	if:	fere	ent	f	r	om N	IASA)							
	ſ		/	3		[]		[]	[]		(A	[DD/	DI	E T I	ETE)
* CIL RE	ETEN	ΤI	ON	RAI	'ION	ΑL	E:	(I:	f a	pŗ	1	icak			-	TAU! TAU!		[]	
REMARKS:	ANE	r (HE	NAS	A A	RE	I	n A	GRE	EI	Æ.	NT.									

ASSESSM ASSESSM NASA FM	ENT	'I	D:		E	/06/ MU-8 02-F	04	X									A DA SELI N		[]	
SUBSYSTI MDAC ID ITEM:					8		L	IN	E.	AND	V	EN'	r :	TUBE	AS	SEM	I BLY					
LEAD AND	ALY	ST	:		G.	. RA	FF.	ΑE	LL	I												
ASSESSMI	ENT	:																				
	CR		IC!			ľ		R	ED	UNDA	ANO	CY	so	CREEN	s				C1	IL PEM	•	
]	HD	W/I	U	1C			A				В			C					. E.P.	1	
NASA IOA	[2	/1 /1	lR LR]]	P P]		[P P]	[P P]]	x x]	*
COMPARE	[/]		[]		[]	[]			[]	
RECOMMEN	DA'	ric	ons	:		(If	đi	ifi	fei	ent	f	rc	m	NASA))							
	[/]		[]		[]	[]	((AD	[D/	DE] LE	TE)
* CIL RE	TEN	ITI	ON	R	'ΑΤ	IONA	LE	Ē:	(1	f a	pp	li	.ca	ble)								
DEM DAG														IN			JATE JATE		[[]	
REMARKS: THE IOA	AND	T	HE	N	AS.	A AR	E	IN	ΙA	GRE	EM	EN	т.								3	

ASSESSMEI ASSESSMEI NASA FME	I TN	D:		05				1	NASA DATA BASELINI NEV		x]
SUBSYSTEM MDAC ID: ITEM:	M:		EMU 605 WATER	LIN	E AN	D VEN	T TU	BE AS	SSMEBLY		
LEAD ANA	LYST	':	J. WH	ITMA	N						
ASSESSME	NT:										
(F	ICALI LIGHT		RI A		DANCY B		EENS C	:	CII	
NASA IOA	[2 [2	/1R /1R]	[P]	[P]	[F))	[}	(] * (]
COMPARE	[/]	[]	[]	[]	[]
RECOMMEN	ITAC	ons:	(If	dif	fere	nt fr	om Ni	ASA)			
	[/]	[]	[]	[] ELETE)
* CIL RET	ENT	ION F	RATIONA	ALE:	(If	appl	icab]	A	DEQUATE DEQUATE]

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMEN ASSESSMEN NASA FMEA	TN	ID		EMU		6									NASA 1 BASE	DATA: LINE NEW	[]	
SUBSYSTEM MDAC ID:	M:			EMU 606 WAT	,	L	INE	E AN	D '	VE	ГИ	TU	JBE	A	SSMEB	LY				
LEAD ANA	LYS	T:		J.	WHI	T	(A)	1												
ASSESSME	NT:	:																		
•	CRI		CAL LIGHT				RE	EDUN	IDA:	NC	Y	SCF	REE	NS	3			CL CEN	1	
	F		/FUI				A				В				С				-	
NASA IOA	[3 2	/3 /1R]]	N.]		[[NA]	1	([NA]		[x]	*
COMPARE	[N	/N]		ι	N]		[N]		[и]		[N]	
RECOMMEN	DAT	ric	ons:	((If	d :	if1	fere	ent	f	rc	om 1	NAS	A)						
	[/]		[]		[]		[]	(Al		/DI		ETE)
* CIL RE	TEI	VT]	ION I	RATI	ONA	ΑL	E:	(If	a	pp	oli	cal			ADEQU IADEQU		[]	
REMARKS:	AGI	REI	es W	ITH	THI	3 1	NAS	SA A	ANA	LY	s]	s.								

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-615			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	615	AL CLOSURE	(HUT SID	E)	
LEAD ANALYST:	J. WHIT	MAN			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDANC	Y SCREENS		CIL ITEM
	NC	A	В	С	
NASA [1 /1 IOA [2 /1R] [P] [] [P] [F]	[X] * [X]
COMPARE [N /N] [и][и] [и]	[]
RECOMMENDATIONS:	(If d	ifferent f	rom NASA)		
[2 /1R] [P . [P] [F] (A)	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If app		ADEQUATE ADEQUATE	[]
REMARKS: THE IOA AND THE	WAGA ADE	NOW THE			
A FAILURE MUST F SOP FUNCTION TO DOES NOT ENSURE FUNCTIONS, BUT R	TRST REST CAUSE LOUTHE IMME THE IMME	ULT IN LOS SS OF LIFE DIATE LOSS EIR LOSS A	S OF PLSS BECAUS OF PLSS S A FUNCT	FUNCTION E THE DEFI AND SOP TION OF FA	THEN LOSS OF INED FAILURE
SEVERITY DEFINIT	ION. TH	E IOA RECO	MMENDS A	2/1R CRIT	ICALITY AND

FAILURE OF SCREEN C TO INDICATE THE APPLICABLE SCENARIO.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DATA BASELINI NEV]
MDAC ID:	EMU 806 BODY SEAL	CLOSURE				
LEAD ANALYST:	G. RAFFAEL	LI				
ASSESSMENT:						
CRITICAL: FLIGHT		DUNDANCY	SCREEN	ıs	CIL	
HDW/FUI		В		С	TIE	r1
NASA [2 /2 IOA [2 /2] [] [] []	[X [X] *]
COMPARE [/] [] [] [3	[]
RECOMMENDATIONS:	(If diffe	erent fro	om NASA	.)		
[/	1 C) (] [[ADD/D]] ELETE
* CIL RETENTION FREMARKS: THE IOA AND THE N			I	ADEQUATE NADEQUATE	•]

ASSESSMEI NASA FME	NT II	D:	12/10/ EMU-60 102-FI	00					NASA DA BASELI N]
SUBSYSTEM MDAC ID:	M:		EMU 600 NECK 1	RING	AND	VENT	SEAL	AS	SEMBLY			
LEAD ANA	LYST	:	J. WH	[TMA]	N							
ASSESSMEI	NT:											
(LIGH	r				SCRE				CIL	
	HD	W/FUI	NC	A		В			С			
NASA IOA	[2 [2	/2 /2]	[N] A]	[[N.] A]	[NA]		[X] *]
COMPARE	[/	1	[N]	[N]	[n]		[]
RECOMMEN	DATI	ons:	(If	dif:	fere	nt fr	om NA	SA)				
	[/]	[]	[]	[]	(AI	[DD/DI] ELETE)
* CIL RE	rent:	ION I	RATION	ALE:	(If	appl	icabl		ADEQUAT ADEQUAT		[]
REMARKS:										-		J

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSME ASSESSME NASA FME	TN	II):	EMU	10/86 -613 -FM20				1		DATA ELINE NEW	[]	
SUBSYSTE MDAC ID:				EMU 613 GIM		SY.									
LEAD ANA	LYS	ST:	:	J.	WHITMAI	1									
ASSESSME	NT:	:													
	CRI		CAL	ITY	RI	EDUI	NDANCY	SCF	REENS				IL CEN	νſ	
	F		/FU		A		В		(C				-	
NASA IOA]	1	/1 /1]	[]	[[]	[]		[X X]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	[ADI	CIC	ns:	(If diff	fere	ent fr	om N	IASA)						
	[/]	[]	[]	[]	(Al	[DD,	/DE] ELI	ETE)
* CIL RE		ITI	ON	RATI	ONALE:	(I:	f appl:	icab	1		JATE JATE	_]	
THE IOA	ANI	ľ	HE	NASA	ARE IN	I AC	GREEMEI	T.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-614 102-FM21	5 1		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 614 BELLOWS	ASSEMBLY			
LEAD ANALYST:	J. WHITE	MAN			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDANC	Y SCREENS	3	CIL ITEM
HDW/FU		A	В	С	
NASA [1 /1 IOA [2 /1R] [] [P] [P] [P]	[X] *
COMPARE [N /N] [N] [N] [и]	[]
RECOMMENDATIONS:	(If d	ifferent 1	from NASA)	
[2 /1F	2][P] [P] [F]	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If app		ADEQUATE NADEQUATE	
REMARKS: THE IOA AND THE A FAILURE MUST I OF THE SOP FUNCT FAILURE DOES NOT FUNCTIONS, BUT I	FIRST RES FION TO C FENSURE RATHER TH	SULT IN LOS CAUSE LOSS THE IMMED HEIR LOSS	SS OF HTE OF LIFE. IATE LOSS AS A FUAN	BECAUSE OF PLSS O	THEN THE LOSS THE DEFINED F SOP

SEVERITY DEFINITION. THE IOA RECOMMENDS A 2/1R CRITICALITY AND

FAILURE OF SCREEN C TO INDICATE THE APPLICABLE SCENARIO.

ASSESSM ASSESSM NASA FM	ENT	I	D:	EN	2/10 MU-6 D2-F	10										A DA SELI N		[x]	
SUBSYST: MDAC ID ITEM:				EN 61 MU	LO	PL	E ¹	WA"	rer	C	ON!	NECT	ror	(H	UT	HAL	F)				
LEAD AND	ALY	ST	:	J.	WH	ΙT	MA:	N													
ASSESSMI	ENT	:																			
		F.	ICAL: LIGH'	r	?			EDU	JNDA	M		SCF	REEN	S					IL PER	vi	
	1	HD	W/FUI	NC.			A				В			С							
NASA IOA	[2 2	/1R /1R]]	P P] j		[P P]	[P P]			[X X]	*
COMPARE	[/]		[]		[3	[J			[]	
RECOMMEN	IDA:	ric	ONS:		(If	di	ifi	fer	ent	: f	ro	om N	IASA))							
	[/]		[]		[]	[]		(AI	[DD/] :LE	ETE)
* CIL RE													•			UAT UATI		[]	
THE IOA	ANL	ן' נ	THE N	IAS.	A AF	Œ	IN	ΙÀ	GRE	EM	ΕN	\mathbf{T} .									

ASSESSME ASSESSME NASA FME	NT	ID		EMU	10/86 -607 -FM23						DATA LINE NEW	[]	
SUBSYSTE MDAC ID:	M:			EMU 607 MUI		WATE	R CON	NECT	OR (H	UT H	ALF)			
LEAD ANA	LYS	T:		J.	WHITMA	N								
ASSESSME	NT:	;												
	CRI		CAI	TTY	R	EDUN	IDANCY	SCR	EENS			CII		
	H			INC	A		В		c					
NASA IOA	[3	/3 /3]	[]	[]	[]		[] *]	
COMPARE	[/)	[]	[3	[]		[3	
RECOMMEN	DAT	ric	ns:	: (If dif	fere	ent fr	om N	(ASA)					
	[/]	[]	[]	(]	(A	[DD/I] DELETE)
* CIL RE		TI	ON	RATI	ONALE:	(If	appl	icab	A		JATE JATE	[]	
REMARKS: THE IOA		r c	HE	NASA	ARE I	n Ac	REEME	NT.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-610A		A DATA: SELINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	EMU 610 MULTIPLE WAT	TER CONNECTOR (HUT	HALF)
LEAD ANALYST:	J. WHITMAN		
ASSESSMENT:			
CRITICAL FLIGH		INDANCY SCREENS	CIL ITEM
HDW/FU	NC A	В С	
NASA [3 /3 IOA [2 /1R] []]	[] [] [P] [P]	[] * [x]
COMPARE [N /N] []]	[N] [N]	[N]
RECOMMENDATIONS:	(If differ	ent from NASA)	
[/] []	[] []	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE: (1		QUATE [] QUATE []
REMARKS: BECAUSE THE IOA	EMCOMPASSED E	OTH H2O AND O2 LEA	KAGE IN ONE
ANALYSIS AND THE	NASA SEPARAT	ED THEM IN A MANNE	R ACEPTABLE TO JSC

22206, THE IOA AGREES WITH THE NASA FINDINGS.

	/ /	•		NASA DATA:	<u> </u>
ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-608			BASELINE	
SUBSYSTEM: MDAC ID: ITEM:	EMU 608 MULTIPLE	E WATER (CONNECTOR	(HUT HALF)	
LEAD ANALYST:	J. WHIT	MAN			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDA	NCY SCREE	INS	CIL ITEM
HDW/FU		A	В	С	
NASA [3 /2R IOA [2 /2] [P]	[F] []	[P] []	[X] * [X]
COMPARE [N /N] [и]	[и]	[N]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[2 /2] [1	[]	[] (A)	[] .DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	ipplicable	e) ADEQUATE INADEQUATE	
REMARKS: THE IOA AGREES WITHE IOA ANALYSIS PHASE (DUE TO MANULL RESULT IN ATTHE MISSION	BELIEVE	S A FALL	LURE TO N	OTE DURING I	L FAILURE)

ASSESSMI ASSESSMI NASA FMI	ENT	1	D:	EMU	10/86 -609 -FM26					NASA DA BASELI N]
SUBSYSTI MDAC ID: ITEM:				EMU 609 MUL	TIPLE	WAT	ER CO	NNEC:	ror (HUT HAL	F)	
LEAD ANA	YLY	ST	:	J. 1	WHITMA	N.						
ASSESSME	ENT	:										
	CR		ICAL LIGH	ITY T	R	EDUN	NDANC?	SCF	REENS		CIL	_
]			NC	A		I	3	•	С	ITEM	ī
NASA IOA	[3 2	/3 /2]	[[]	[]]]	[[x) *
COMPARE	[N	/N]	[]	[)	[]	[N	J
RECOMMEN	DAT	ric	ONS:	(I	f dif	fere	nt fr	om N	ASA)			
	[2	/2]	[]	[]	[[A [ADD/DE	
* CIL RE	TEN	T	ON I	RATIO	NALE:	(If	appl	icab	le)			
REMARKS:									INA	DEQUATE DEQUATE	į]
ALTHOUGH	DC	FF	ING	WITH	THE N	IWC :	ENGAG	ED H	AC RE	EN DEMO	MCMD a mi	mn

ALTHOUGH DOFFING WITH THE MWC ENGAGED HAS BEEN DEMONSTRATED, THE IOA RECOGNIZED THE PROCEDURE AS A CONTINGENCY PROCEDURE WHICH CANNOT BE USED TO DOWNGRADE A CRITICALITY.

ASSESSMI ASSESSMI NASA FMI	ENT	II		EMU	10/86 -619 -FM27				N	IASA I BASEI		[]	
SUBSYSTIMDAC ID				EMU 619 HAR	NESS S	rrap	AND	HARN	ESS E	AD AS	SSME	BLY		
LEAD AN	ALY	ST	:	J. '	MTIHW	N								
ASSESSM	ENT	:												
	CR:		_	ITY	RI	EDUN	IDANCY	SCR	REENS			CII		
	1		LIGH W/FU		A		E	3	C	3		111	514	
NASA IOA]	3	/3 /3]	[]	[]	[]		[]	*
COMPARE	[/]	E]	[]	[1		[]	
RECOMME	NDA'	TI	ons:	(If dif	fere	ent fr	om N	IASA)					
	[/]	[3	[]	[]	(A	[DD/I] DELE	TE)
* CIL R		NT	ION	RATI	ONALE:	(If	appl	icab	7	ADEQU.		[]	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	EMU-851	B51X BASELINE []						
	EMU 851 HUT TMG							
LEAD ANALYST:	G. RAFF	AELLI						
ASSESSMENT:								
CRITICAI FLIG	LITY	REDUNDA	NCY SCRE	ENS	CIL			
	INC	A	В	С	ITEM			
NASA [3 /3 IOA [2 /2] [P]	[] [F]	[] [P]	[x] *			
COMPARE [N /N] [N]	[N]	[N]	[N]			
RECOMMENDATIONS:	(If d	ifferent	from NA	SA)				
[2 /2] []	[]		[A] .DD/DELETE)			
* CIL RETENTION	RATIONALI	E: (If a	pplicable	•				
REMARKS:				ADEQUATE INADEQUATE	[]			
THE IOA CONSIDER CAUSE SIGNIFICAN TERMINATION. TH AND INCLUSION IN	T CREWPER E IOA, TH	RSON DIS BEREFORE	COMFORT A	AND CAUSE MI ENDS A 2/2 C	SSION			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 NASA DAT. EMU-602 BASELIN 102-FM3 NE	
SUBSYSTEM: MDAC ID: ITEM:	EMU 602 NECK RING AND VENT SEAL ASSEMBLY	
LEAD ANALYST:	J. WHITMAN	
ASSESSMENT:		
CRITICAL		CIL ITEM
FLIGHT HDW/FU		
NASA [1 /1 IOA [2 /1R] [] [] [] [] [P]	[X] *
COMPARE [N /N] [N] [N]	[]
RECOMMENDATIONS:	(If different from NASA)	
[2 /1R	[P] [P] [F]	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE: (If applicable) ADEQUATIONALE: INADEQUATION	

THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA BELIEVES THE PLSS AND THE SOP ARE REDUNDANT TO EACH OTHER AND MUST EACH BE FAILED FUNCTIONALLY FOR LOSS OF LIFE TO RESULT. ADDITIONALLY, THE IOA RECOMMENDS FAILURE OF SCREEN C TO INDICATE THE POSSIBILITY THAT A SINGLE EVENT MAY RESULT IN LOSS OF THE PLSS AND SOP FUNCTIONS. THE IOA, THEREFORE, RECOMMENDS A 2/1RC CRITICALITY.

ASSESSMEI ASSESSMEI NASA FME	NT :	ID:	8/06, EMU-8 102-1	301	X							ASA DA BASEL:	INE] x]	
SUBSYSTEM MDAC ID: ITEM:	M:		EMU 801 NECK	RI	NG	AND	VEN	4T	SEA	L A	SSI	EMBLY				
LEAD ANAI	LYSI	r:	G. RA	AFF.	ΑE	LLI										
ASSESSMEN	T:															
C	F	LIGH	ITY IT INC		Ri A	EDUN	DANC	ey B	SCR	EEN	s c			CII		
NASA IOA	[3 [3	/3]	[P]	[P]	[[_]		[]	*
COMPARE	[/]	Į.	N]	[N	3	[N	J		[]	
RECOMMEND	ATI	ons:	(If	di	fí	ere	nt f	ro	m N	ASA)						
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* CIL RET											AD AD	EQUAT:	E]]	·

ASSESSME ASSESSME NASA FME	NT :	ID	:	8/00 EMU- 102-	-802X						DATA: LINE NEW	[
SUBSYSTEMDAC ID:	м:			EMU 802 NECI	K RING	AND	VENT	SEA	L ASS	EMBL	Y				
LEAD ANA	LYS	T:		G. 1	RAFFAE	LLI									
ASSESSME	NT:														
I			CAL	ITY F	R	EDUN	IDANCY	SCR	EENS			CI	L EN	1	
	H	DW,	/FU	NC	A		В		C						
NASA IOA	[3 2	/3 /2]	[]]]	[]		[x]	*
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RECOMMEN	DAT	10	ns:	(:	If dif	fere	ent fro	om N	ASA)						
	[/]	[)	[]	[]	(Al	[\DC	/DI] ELE	TE)
* CIL RE	TEN'	TI	ON :	RATI(ONALE:	(If	appl:	icab	le) A INA	DEQU DEQU	ATE ATE	[]	
REMARKS:	1 CD	כדכד	c M	TMII (TILLE MA	C 3 7	MATVC'	דכ א							חם

THE IOA AGREES WITH THE NASA ANALYSIS AND RECOMMENDS A HAZARD ANALYSIS TO REVIEW IMPACTS OF A LOOSE SCREW IN THE EMU.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-603			NASA DATA BASELINE NEW	-
SUBSYSTEM: MDAC ID: ITEM:		G AND VEN	r seal a	SSEMBLY	
LEAD ANALYST:	J. WHITM	AN			
ASSESSMENT:					
FLIGH'			Y SCREEN	s	CIL ITEM
HDW/FU	NC 2	A :	В	С	
NASA [3 /1R IOA [1 /1] [P] []	F] [P]	[X] * [X]
COMPARE [N /N] [1	и] [и	1] [N]	[]
RECOMMENDATIONS:	(If di	fferent f	rom NASA)	
. [/] [] [) [[] OD/DELETE)
* CIL RETENTION 1	RATIONALE	: (If app		ADEQUATE NADEQUATE	[]
REMARKS: THE IOA AGREES WI ALSO RECOMMEND FA THE CASUAL EVENT	AILURE OF (E.G. IMI	SCREEN C PACT) WHIC	SIS. HOW TO REFLA	WEVER, THE ECT POSSIBI TS IN FAILU	IOA WOULD
LATCH MECHANISM (JAN CAUSE	FAILURE (OF THE O	IHERS.	

NASA FMEA #: 102-FM7 NEW [X] SUBSYSTEM: EMU MDAC ID: 843 ITEM: HARD TORSO SHELL LEAD ANALYST: G. RAFFAELLI ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL FLIGHT HDW/FUNC A B C NASA [3 /3] [] [] [] * IOA [3 /3] [P] [F] [P] [] COMPARE [/] [N] [N] [N] [] RECOMMENDATIONS: (If different from NASA) [/] [] [] [] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable)	ASSESSMENT ASSESSMENT					7							SA DA' BASELI]	
MDAC ID: 843 ITEM: HARD TORSO SHELL LEAD ANALYST: G. RAFFAELLI ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL FLIGHT HDW/FUNC A B C NASA [3 /3] [] [] [] [] * IOA [3 /3] [P] [F] [P] [] COMPARE [/] [N] [N] [N] [] RECOMMENDATIONS: (If different from NASA) [/] [] [] [] [] [] * CIL RETENTION RATIONALE: (If applicable)			•	102-F	M7	-									_		
ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL FLIGHT HDW/FUNC A B C NASA [3 /3] [] [] [] [] * IOA [3 /3] [P] [F] [P] [] COMPARE [/] [N] [N] [N] [] RECOMMENDATIONS: (If different from NASA) [/] [] [] [] [] [] * CIL RETENTION RATIONALE: (If applicable)	MDAC ID:	:		843	TOF	RSC	SHI	ELL									
CRITICALITY REDUNDANCY SCREENS FLIGHT HDW/FUNC A B C NASA [3 /3] [] [] [] [] * IOA [3 /3] [P] [F] [P] [] COMPARE [/] [N] [N] [N] [] RECOMMENDATIONS: (If different from NASA) [/] [] [] [] [] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable)	LEAD ANALY	YST:		G. RA	FFA	ÆI	LI										
FLIGHT HDW/FUNC A B C NASA [3 /3] [] [] [] [] * IOA [3 /3] [P] [F] [P] [] COMPARE [/] [N] [N] [N] [] RECOMMENDATIONS: (If different from NASA) [/] [] [] [] [] * CIL RETENTION RATIONALE: (If applicable)	ASSESSMENT	r:															
NASA [3 /3] [] [] [] [] * IOA [3 /3] [P] [F] [P] [] COMPARE [/] [N] [N] [N] [] RECOMMENDATIONS: (If different from NASA) [/] [] [] [] [] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable)	C					RI	DUN	DAN	CY	SCF	REENS	5				Ī	
COMPARE [/] [N] [N] [N] [] RECOMMENDATIONS: (If different from NASA) [/] [] [] [] [] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable)						A			В			С					
RECOMMENDATIONS: (If different from NASA) [/] [] [] [] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable)	NASA IOA	[3	/3 /3]	[P]	[[F]	[P]		[]	*
[/] [] [] [] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable)	COMPARE	[/]	[N]	(N]	[N]		[]	
(ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable)	RECOMMEND	ATIC	ONS:	(If	đ:	ifi	fere	nt	fr	om N	IASA)	١					
ADECIIATE []		[/]	[]	[]	[]	(AI	[DD/		TE)
INADEQUATE []	* CIL RET	ENT]	ION I	RATION	ALI	€:	(If	aŗ	pl:	icak		IA IAV	DEQUAT DEQUAT	E	[]	
REMARKS: THE IOA AND THE NASA ARE IN AGREEMENT.		ND T	CHE I	NASA A	RE	I	N AG	REE	ME	NT.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-844X 102-FM8		NASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EMU 844 HARD TORSO SI	HELL		
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICALI FLIGHT HDW/FUN	3	NDANCY SCREI B	ens C	CIL ITEM
NASA [2 /1R IOA [2 /1R] [P]] [P]	[P] [P]	[P] [P]	[X] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If differe	ent from NAS	SA)	
[/] []	[]	[] (A	[] DD/DELETE
* CIL RETENTION R REMARKS:	RATIONALE: (I	f applicable	e) ADEQUATE INADEQUATE	[]

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMEN ASSESSMEN NASA FME	T	ID		EM	06/8 J-84 2 -FM	5X								ì			DA' ELII N	NE]	
SUBSYSTEM MDAC ID:	M:			EM 84! HAI		OF	esc	SH	ŒLI	<u>.</u>												
LEAD ANA	LYS	T:		G.	RAF	'F <i>P</i>	ΕI	LI														
ASSESSME	NT:																					
	CRI		CAL				RE	DUN	IDAI	NC.	Y	SC	REEN	IS					CI		1	
	H		IGH'				A			1	В			(С						_	
NASA IOA	[2	/1R /1R]		[P P]		[]	P P]	[P P]			[X X]	*
COMPARE	[/]		[]		[]	{			3			[]	
RECOMMEN	DAI	ric	ns:		(If	d :	if	fere	ent	f	r	om	NAS	A)								
	[/]		[]		[]		[]		(A		'D	ELI	ETE)
* CIL RE		NT]	ОИ	RAT	ION	AL	E:	(11	f a	рp	1:	ica					ľAU(ľAU([]	
REMARKS: THE IOA	ANI	מ ס	THE	NAS	A A	RE	I	N A	GRE	EM	E	NT.										

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-629 103-FM1	NASA DATA: BASELINE [] NEW [X]
	EMU 629 SCYE BEARING ASSEMBLY	
LEAD ANALYST:	J. WHITMAN	
ASSESSMENT:		
CRITICALI FLIGHT HDW/FUN		S CIL ITEM
NASA [1 /1 IOA [2 /1R] [] [] [] [P] [P] [] [X]* F] [X]
COMPARE [N /N] [и] [и] [и ј [ј
RECOMMENDATIONS:	(If different from NASA)	l.
[2 /1R] [P] [P] [F] [] (ADD/DELETE)
* CIL RETENTION R REMARKS:		ADEQUATE [] IADEQUATE []

THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA BELIEVES THE PLSS AND THE SOP ARE REDUNDANT TO EACH OTHER AND MUST EACH BE FAILED FUNCTIONALLY FOR LOSS OF LIFE TO RESULT. ADDITIONALLY, THE IOA RECOMMENDS FAILURE OF SCREEN C TO INDICATE THE POSSIBILITY THAT A SINGLE EVENT MAY RESULT IN LOSS OF THE PLSS AND THE SOP FUNCTIONS. THE IOA, THEREFORE, RECOMMENDS A 2/1Rc CRITICALITY.

ASSESSMI ASSESSMI NASA FMI	ENT	ID:		EMU-	632					NASA BASI	DATA ELINE NEW	[]	
SUBSYSTEMDAC ID			(EMU 632 ARM	BEAI	RING A	ASSEM	BLY							
LEAD AN	ALYS	ST:	j	J. W	HITI	IAN									
ASSESSMI	ENT	:													
	CRI		ALI GHT	ΓY		REDUI	NDANC	Y SCF	REENS	5			IL TEM	1	
	I	HDW/	'FUN	2		A	1	В		С					
NASA IOA	[[2 / 2 /	'2 '2))]	NA]	[1	[AV	[NA]		[X X]	*
COMPARE	[/)	[и ј	[1	1]	[и ј		[]	
RECOMME	radv	rion	is:	(I	f di	ffere	ent fi	com N	IASA)						
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DEMA DICC.	_									•		-		-	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMEI ASSESSMEI NASA FMEI	I Tr		8/06/8 EMU-81 103-FM	L6X		NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM MDAC ID:	M:		EMU 816 ARM BI	EARIN	NG AS	SEM	BL	·Υ						
LEAD ANA	LYST	:	G. RAI	FFAEI	LLI									
ASSESSME	T:													
(ICALI		RI	EDUND	ANC	Y	SCREI	ENS	5	_	IL TEN	1	
	HD	W/FUI	1C	A			В			С				
NASA IOA	[2 [2	/1R /1R]	[P]	[NA F	.]	[P] P]	[X X]	*
COMPARE	[/]	[]	[N]	[]	[]	
RECOMMEN	ITAC	ons:	(If	dif	feren	t f	rc	m NA	SA)				
	[/]	[]	[F]	[]	DD.	/DI] ELE	ETE)
* CIL RE	TENT	I NOI	RATION	ALE:	(If	app	li	.cable		ADEQUATE NADEQUATE]	
REMARKS:										~	•		-	

THE IOA AND THE NASA ARE IN AGREEMENT EXCEPT FOR SCREEN B. THE IOA RECOMMENDS FAILURE OF SCREEN B BECAUSE THE FAILED ITEM IS NOT STANDBY REDUNDANT BUT ONLY TRANSFERS THE FUNCTION TO A STANDBY REDUNDANT ITEM.

	8/06/87 EMU-865X 103-FM12		1	NASA DATA: BASELINE NEW]
	EMU 865 ARM BEARII	NG ASSEMB	LY			
LEAD ANALYST:	G. RAFFAE	LLI				
ASSESSMENT:						
CRITICAI FLIGH HDW/FU	T	EDUNDANCY B		c	CIL	I
NASA [2 /1F IOA [2 /1F	[P] [F] []	P] P]	[X] *]
COMPARE [/] [] [] [1	[]
RECOMMENDATIONS:	(If dif:	ferent fr	om NASA)			
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* CIL RETENTION REMARKS:	RATIONALE:	(If appl	i	ADEQUATE ADEQUATE	[]

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		NASA DATA: BASELINE [] NEW [X]
MDAC ID:	EMU 628 UPPER/LOWER ARM RESTRAINT	AND BLADDER ASSEMBLY
LEAD ANALYST:	J. WHITMAN	
ASSESSMENT:		
FLIGH:		ITEM
HDW/FUI	NC A B	С
NASA [2 /1R IOA [2 /1R] [P] [NA] [] [P] [P] [P] [X] * P] [X]
COMPARE [/] [] [N] [] []
RECOMMENDATIONS:	(If different from NASA)	
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* CIL RETENTION I	RATIONALE: (If applicable)	
		ADEQUATE [] ADEQUATE []
IOA RECOMMENDS FA	NASA CRITICALITIES ARE IN A AILURE OF SCREEN B DUE TO T F AND ITS FAILURE NOT READI	HE ITEM FAILING IS NOT

ASSESSMENT ASSESSMENT NASA FMEA	ID:	12/10/80 EMU-6277 103-FM1	A					NASA DATA BASELINE NEW]	
SUBSYSTEM: MDAC ID: ITEM:		EMU 627 UPPER/L	OWE	R ARM	RES	STRAIN	T	AND BLADD	ER AS	SEMBLY	?
LEAD ANALYS	ST:	J. WHIT	MAN								
ASSESSMENT	:										
CR:	ITICAL		RE	DUNDA	ИСХ	SCREE	ENS	5	CIL ITEN	1	
1	FLIGH HDW/FU		A		В			С			
NASA [] AOI	1 /1 2 /1R] [P]	[[P]	[P]	[X [X] *]	
COMPARE [n /n] [N]	[N]	[N]	[1	
RECOMMENDA	TIONS:	(If d	liff	erent	fr.	om NAS	SA))			
ι	2 /1R	:] [P]	[P]	[F] (A	[DD/D] ELETE)	
* CIL RETE	NTION	RATIONAL	Œ:	(If a	ppl	icable		ADEQUATE NADEQUATE	_]	
REMARKS: THE IOA AN	ID THE	NASA ARE	E NO	T IN	AGR	EEMEN'	г.	THE IOA	BELI	EVES T	HE

PLSS AND THE SOP TO BE REDUNDANT AND EACH MUST FAIL TO CAUSE LOSS

REDUNDANCIES. THE IOA THEREFORE RECOMMENDS A 2/1RC CRITICALITY.

OF LIFE. ADDITIONALLY, THE IOA SUGGESTS FAILING SCREEN C TO REFLECT SCENARIO WHERE A SINGLE EVENT CAN RESULT IN LOSS OF

ASSESSMI ASSESSMI NASA FMI	ENT	I		EM	/06/ IU-8)3-F	66	X						N		DAT ELIN]	
SUBSYSTE MDAC ID:				EM 86 LC	6	A	RM	RI	ESTR	AI	IT .	AND 1	3LA	DDE	R AS	SSEM	BL	Y	
LEAD ANA	LY	ST	:	G.	RA	FF.	AE:	LL	I.										
ASSESSME	:NT	:																	
		F	ICAL LIGH	r	•			EDU	JNDA	NCY	S	CREEN	IS				IL TEI	M	
	1	HDV	/FU	NC			A			E	}		С						
NASA IOA		2	/1R /1R]		[P P]		[F]	((P]		[X X]	*
COMPARE	[/]		[]		[]	נ]		[]	
RECOMMEN	DAT	CIC	ons:		(If	đi	ifi	fer	ent	fr	om	NASA	.)						
	[/]		[]	,	[]	[]	(.	[ADD/	/DF] ELF	ETE
* CIL RE REMARKS: THE IOA												I		-	JATE JATE]	
		_			1717	-	T 11	י ה	GREI	TIT.	AT.								

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-817X	NASA DATA: BASELINE NEW	
MDAC ID:	EMU 817 WRIST DISCONNECT		
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICAL		CY SCREENS	CIL ITEM
FLIGH HDW/FU		в с	TIEN
NASA [2 /1R IOA [2 /1R] [P] [] [P]	NA] [P] F] [P]	[X] *
COMPARE [/] [] [N] []	[]
RECOMMENDATIONS:	(If different	from NASA)	
(/] [] [F] [] (A)	[] DD/DELETE)
	RATIONALE: (If ap	plicable) ADEQUATE INADEQUATE	
THE IOA RECOMMEN	DS FAILURE OF SCF	AL AGREEMENT EXCEPT REEN B BECAUSE THE I'MND IS NOT STANDBY R	TEM THAT

ASSESSM ASSESSM NASA FM	ENT	I		EM	'06/ W-8 3-F	18									DAT ELIN NE	E []	
SUBSYST: MDAC ID ITEM:				EM 81 WR	.8	D	IS:	CONI	NECT	İ									
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NASA IOA	[2 2	/1R /1R]		[P P]]	F F]	[P P]]	X X]	*
COMPARE	[/]		[]	[]	[]		[]	
RECOMME	IDA!	ric	ONS:		(If	d:	ifi	fere	ent	fro	om N	IASA))						
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* CIL RERESTRE THE IOA	;											·			ATE ATE	[]	
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ASSESSMEN ASSESSMEN NASA FME	NT ID:	EMU-63								NASA DATA: BASELINE [] NEW [X]						
SUBSYSTEM MDAC ID:	M:	EMU 635 WRIST	DISC	CONNE	CT											
LEAD ANA	LYST:	J. WHI	TMA	Į												
ASSESSME	NT:															
	CRITICAI FLIG		RI	EDUND	ANC'	Y	SCREE	NS	;		CIL	ĸ				
	HDW/FU		A		,	В			С		110.	•				
NASA IOA	[1 /1 [2 /1] ?]	[[P]	[P]	[F]	[X] *				
COMPARE	[N /N]	[N]	[]	N]	[N]	[}				
RECOMMEN	DATIONS	(If	dif	feren	t f	ro	m NAS	A)								
	[2 /1]	R]	[P]	[P]	[F		[[D/DC] ELETE)				
* CIL RE	TENTION	RATION	ALE:	(If	app	li	.cable			EQUATE	[]				
REMARKS:										-	-	_				

THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA BELIEVES THE PLSS AND THE SOP TO BE EXISTING REDUNDANCIES WHICH MUST EACH FAIL TO RESULT IN LOSS OF LIFE. ADDITIONALLY, THE IOA SUGGESTS SCREEN C BE FAILED TO INDICATE POSSIBLE LOSS OF REDUNDANCIES DUE TO A SINGLE EVENT. THE IOA, THEREFORE, RECOMMENDS A 2/1Rc CRITICALITY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-871X 103-FM2			NASA DATA BASELINI NEV]
	EMU 871 SCYE BEARI	ING ASSEM	BLY			
LEAD ANALYST:	G. RAFFAEI	LLI				
ASSESSMENT:						
CRITICAL: FLIGHT		DUNDANCY	SCREE	NS	CIL	vi
HDW/FU		В		С	+ 1 D 1	· L
NASA [1 /1 IOA [1 /1] [] []	[]	[] *]
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RECOMMENDATIONS:	(If diff	erent fro	om NAS	A)		
[/] [] []		[ADD/DE] ELETE
* CIL RETENTION F REMARKS: THE IOA AND THE N			:) ADEQUATE INADEQUATE]

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-634 103-FM20			NASA DATA BASELINE NEW	
MDAC ID:	EMU 634 WRIST DIS	CONNE	CT		
LEAD ANALYST:	J. WHITM	AN			
ASSESSMENT:					
CRITICALI FLIGHT HDW/FUN	ר		ANCY SCRE	ENS C	CIL ITEM
NASA [2 /2 IOA [2 /2] [1] NA]	[] [AN]	[] [NA]	[X] * [X]
COMPARE [/] []	N]	[N]	[N]	[]
RECOMMENDATIONS:	(If di	fferer	nt from NA	ASA)	
[/] [3	[]	[] (A)	[] .DD/DELETE)
* CIL RETENTION D	RATIONALE	: (If	applicabl	.e) ADEQUATE INADEQUATE	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSME ASSESSME NASA FME	NT I	D:		633				NASA I BASEI		[x]	
SUBSYSTE MDAC ID:	M:		EMU 633 WRIS	r di	SCONI	NECT							
LEAD ANA	LYSI	:	J. W	HITM	AN								
ASSESSME	NT:												
	F	CICAL LIGH W/FU			REDUI A	'DANC	Y SCR	EENS C		CI	L PEN	4	
NASA IOA	[2 [2	/2 /2]	[1	[AV	[]	[AV	[] [NA]		[X X]	*
COMPARE	[/]	[1	1]	[1	1]	[N]		[]	
RECOMMEN	DATI	ons:	(If	di	ffere	ent fi	com N	ASA)					
	[/]	[]	[]	[]	(AD	[D/	'DE] ELF	ETE)
* CIL RETREMENTS: THE IOA								le) ADEQUA INADEQUA		[]	

ASSESSMEI ASSESSMEI NASA FMEZ	I TN	D:		36								NASA D. BASEL		ĺ	x]	
SUBSYSTEM MDAC ID:	M:		EMU 636 WRIST	D:	ısc	CONNE	ECI	•									
LEAD ANA	LYST	:	J. WHI	ľľ	(A)	ī											
ASSESSME	T:																
(F	ICALI LIGHT W/FUN	r C		RE A	EDUNE	AN	ICY B		CREE	NS	c C		CI		A	
NASA IOA	[3 [1	/1R /1]	[P NA]	[F	'] 'A]] [P] NA]		נ נ	X X]	*
COMPARE	[N	/N	3	[N]	[N]		[и]		[]	
RECOMMENI	DATI	ons:	(If	d:	iff	eren	nt	fr	om	NAS	A)						
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REMARKS:														•		-	

THE IOA AGREES WITH THE NASA ANALYSIS.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		X		NASA DAT BASELIN NE	
	EMU 852 ARM TMG				
LEAD ANALYST:	G. RAFF.	AELLI			
ASSESSMENT:					
CRITICAL FLIGH	ITY	REDUNDA	NCY SCR	EENS	CIL ITEM
HDW/FU		A	В	С	1150
NASA [3 /3 IOA [2 /2] [p]	[[] [P]	[] * [X]
COMPARE [N /N] [N]	[N]	[N]	[N]
RECOMMENDATIONS:	(If d	ifferent	from N	ASA)	
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* CIL RETENTION	RATIONAL	E: (If a	pplicab	le) ADEQUATE	
REMARKS:				INADEQUATE	
THE IOA CONSIDER CAUSING SIGNIFIC COULD BE TERMINA CRITICALITY AND	ANT CREWITED. TH	PERSON D E IOA, T	ISCOMFO HEREFOR	RT SUCH THAT	THE MISSION S A 2/2
CKITICALITI AND	TRCTOSTO	N IN INE	. СІБ РО	K INIS CALLA	KE MUDE.

	8/06/87 EMU-872X 103-FM2A	1	NASA DATA: BASELINE (NEW (
MDAC ID:	EMU 872 SCYE BEARIN	IG ASSEMBLY		
LEAD ANALYST:	G. RAFFAELI	LI.		
ASSESSMENT:				
CRITICAL: FLIGH' HDW/FU	r	DUNDANCY SCREENS B]	CIL ITEM
•		T NAI T	. 1	r v 1 *
IOA [2 /1R] [P]	[NA] [I [F] [I	5]	[X] * [X]
COMPARE [/] []	[и]] [[]
RECOMMENDATIONS:	(If diffe	erent from NASA)		
[/] []	[] [] [(ADI	[] D/DELETE)
* CIL RETENTION	RATIONALE: (ADEQUATE ADEQUATE	[]
REMARKS: THE IOA AGREES WITHE REMAINDER OF			IN AGREEN	MENT WITH

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-815X 103-FM3	NASA DATA BASELINE NEW	: []				
MDAC ID:	EMU 815 SCYE BEARING ASSE	MBLY					
LEAD ANALYST:	G. RAFFAELLI						
ASSESSMENT:							
CRITICAL: FLIGHT	ŗ		CIL ITEM				
HDW/FU	NC A	В С					
NASA [2 /1R IOA [2 /1R] [P] [] [P]	F] [P] F] [P]	[X] * [X]				
COMPARE [/] [] [] []	[]				
RECOMMENDATIONS:	(If different f	rom NASA)					
[/] [P] [] [] (A	[] .DD/DELETE				
REMARKS:	RATIONALE: (If app.	ADEQUATE INADEQUATE	[]				

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SUBSYSTEMDAC ID:	M:		EMU 630 SCYE	BEAR]	ING .	ASSEMI	BLY						
LEAD ANA	LYS	ST:	J. WH	IAMTI	1								
ASSESSME	NT:												
	CRI	TICAL		RI	EDUN	DANCY	SCR	EENS			CIL		
	H	IDW/FU		A		В		C	2				
NASA IOA	[2 /2 2 /2]	[]	[]]]		X] X]]	*
COMPARE	[/]	[)]	[]		[]	
RECOMMEN	DA'I	cions:	(II	f dif	fere	nt fr	om N	ASA)					
	[/]	[]	ľ]	[]	(A	[DD/I) ELE	ETE)
* CIL RE	TEN	NTION	RATIO	NALE:	(If	appl	icab	1	ADEQU ADEQU		[]	
REMARKS:													

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/80 EMU-627 103-FM5	6		NASA DATA BASELINE NEW					
	EMU 627 UPPER/LO	OWER ARM	RESTRAIN'	T AND BLADD	ER ASSEMBLY				
LEAD ANALYST:	J. WHITM	. WHITMAN							
ASSESSMENT:									
CRITICALI FLIGHT	ר				CIL ITEM				
HDW/FUN	NC .	A	В	С					
NASA [1 /1 IOA [2 /1R] [P] [P]	[] [P]	[X] * [X]				
COMPARE [N /N] [и] [N]	[N]	[]				
RECOMMENDATIONS:	(If di	ifferent	from NASA	A)					
[2 /1R] [P] [P]		[] DD/DELETE)				
* CIL RETENTION R	PATTONAT.F	E: (Tf an	nlicahle)	•	•				
		. (II ap	- ·	ADEQUATE INADEQUATE	[]				
REMARKS:	INCN NOF	NOT TN A	CDEEMENM	MIID TOX I					
THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA BELIEVES THE PLSS AND SOP ARE REDUNDANT TO EACH OTHER AND MUST EACH BE FAILED FUNCTIONALLY FOR LOSS OF LIFE TO RESULT. ADDITIONALLY, THE IOA RECOMMENDS FAILURE OF SCREEN C TO INDICATE THAT A SINGLE EVENT MAY RESULT IN LOSS OF THE PLSS AND THE SOP FUNCTIONS. THE									
IOA, THEREFORE, R	IN LOSS ECOMMEND	OF THE P S A 2/1R	LSS AND T C CRITICA	THE SOP FUNC ALITY.	CTIONS. THE				

ASSESSME ASSESSME NASA FME	NT I	D:	12/10 EMU-6 103-F	28	FM8				ASA D BASEI	ATA: INE (NEW (]
SUBSYSTE MDAC ID: ITEM:	M:		EMU 628 UPPER	/LOW	ER A	RM RES	STRA	AINT A	ND BI	.ADDER	ASS	SEMBLY
LEAD ANA	LYST	':	J. WH	ITMA	N							
ASSESSME	NT:											
			ITY	F	EDUN	DANCY	SCF	REENS			IL TEM	
		'LIGH' W/FU	NC I	A		В		С		_	ILM	
NASA IOA	[2	/1R /1R]	[F))]	[N <i>I</i> [P	A]	[P]	[]	X X] *]
COMPARE	[/]	[]	[и]	[]	[]
RECOMMEN	DATI	ons:	(If	dif	fere	nt fro	om 1	NASA)				
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* CIL RE	TENI	NOI	RATION	ALE:	(If	appl	ical	A	DEQU <i>I</i> DEQU <i>I</i>	ATE []
REMARKS: THE IOA AGREES W						TIES A	ARE	IN AG	REEMI	ENT.	THE	IOA

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-814	X		NASA DATA BASELINE NEW	
MDAC ID:	EMU 814 UPPER A	RM RESTRA	INT AND E	BLADDER ASS	EMBLY
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDAN	CY SCREEN	ıs	CIL ITEM
HDW/FU	NC	A	В	С	
NASA [2 /1R IOA [2 /1R] [P] [P] [NA] [F] [P] P]	[X] *
COMPARE [/] [] [N] []	[]
RECOMMENDATIONS:	(If d	ifferent :	from NASA	١)	
[/) [) [F] [[] DD/DELETE)
* CIL RETENTION I	RATIONAL	E: (If app	plicable)		
DEWA DUG -			I	ADEQUATE NADEQUATE	•
REMARKS: THE IOA AND THE I IOA RECOMMENDS FOR UNLIKE THE BLADDI DETECTABLE WHEN I	AILURE OI ER, IS NO	F SCREEN I	B BECAUSE	THE FABRIC	C RESTRAINT

ASSESSMENT DAY ASSESSMENT ID NASA FMEA #:	: EMU-631	6		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 631 ARM BEA	RING ASSEM	IBLY		
LEAD ANALYST:	J. WHIT	MAN			
ASSESSMENT:					
	CALITY IGHT	REDUNDANC	CY SCREE	NS	CIL ITEM
HDW,	/FUNC	A	В	С	
NASA [1 , IOA [2 ,	/1] [/1R] [P] [P]	[] [P]	[X] * [X]
COMPARE [N ,	/N] [N] [иј	[и]	[]
RECOMMENDATION	NS: (If d	ifferent f	from NAS	A)	
[2,	/1R] [P] [P]	[F] (A)	[] DD/DELETE)
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REMARKS:	VII. VII. A.	wom TV 14		INADEQUATE	

THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA BELIEVES THE PLSS AND THE SOP ARE REDUNDANT TO EACH OTHER AND MUST EACH FAIL IN LOSS OF LIFE TO RESULT. ADDITIONALLY, THE IOA RECOMMENDS FAILURE OF SCREEN C TO INDICATE THE POSSIBILITY THAT A SINGLE EVENT MAY RESULT IN LOSS OF THE PLSS AND SOP FUNCTIONS. THE IOA, THEREFORE, RECOMMENDS A 2/1Rc CRITICALITY.

ASSESSMEI NASA FME	NT ID:				NASA DATA BASELINE NEW	-
SUBSYSTEM MDAC ID: ITEM:		EMU 658 BODY SEAI	L CLOSURE	LTA :	SIDE)	
LEAD ANA	LYST:	J. WHITMA	AN			
ASSESSME	T:					
(CRITICAL: FLIGHT	r	REDUNDANC	Y SCRE	ENS	CIL ITEM
	HDW/FU	IC A	A	В	С	
NASA IOA	[1 /1 [2 /1R] [F] [] P]	[] [P]	[X] * [X]
COMPARE	[N /N] [N	4] [N]	[и]	[]
RECOMMENI	DATIONS:	(If dif	fferent f	rom NAS	SA)	
	[2 /1R] [F	?] [P]		[] DD/DELETE)
* CIL RET	TENTION F	RATIONALE:	(If app	licable	e) ADEQUATE INADEQUATE	[]
REMARKS:					THADEQUATE	ſ j

THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA CONSIDERS THE PLSS AND SOP AS REDUNDANT AND THAT EACH MUST FAIL TO RESULT IN LOSS OF LIFE. ADDITIONALLY, TO REFLECT THE SCENARIO WHERE A SINGLE CAUSE CAN LEAD TO LOSS OF BOTH REDUNDANCIES, THE IOA RECOMMENDS A 2/1Rc CRITICALITY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-824 104-FM1			NASA DATA: BASELINE NEW	[]				
MDAC ID:	EMU 824 WAIST R	ESTRAINT	AND BLAD	DER					
LEAD ANALYST:	G. RAFF	RAFFAELLI							
ASSESSMENT:									
		REDUNDA	NCY SCREE	ns	CIL ITEM				
FLIGH HDW/FU		A	В	С	11111				
NASA [2 /1R IOA [2 /1R] [P] P]	[F] [F]	[P] [P]	[X] * [X]				
COMPARE [/] []	[]	[]	[]				
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)					
, t /] []	[]	[] (A)	[] DD/DELETE				
* CIL RETENTION REMARKS:	RATIONAL	E: (If a	applicable	adequate	[]				
THE IOA AND THE	NASA ARE	IN AGRI	EEMENT.		•				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-647			NASA DATA BASELINE NEW	[]		
SUBSYSTEM: MDAC ID: ITEM:	EMU 647 WAIST REST	TRAINT A	ND BLADDI	ER			
LEAD ANALYST:	J. WHITMAN						
ASSESSMENT:							
CRITICAL: FLIGHT	ITY RI	EDUNDANC	Y SCREENS	5	CIL ITEM		
HDW/FUI	NC A		В	С			
NASA [2 /1R IOA [2 /1R] [P] [P] [NA] [F] [P] P]	[X] * [X]		
COMPARE [/] [] [и][]	[]		
RECOMMENDATIONS:	(If diff	ferent f	rom NASA)				
[/] [] [F] [] (AI	[] DD/DELETE)		
* CIL RETENTION H	RATIONALE:	(If app	licable)	3.DE0113.mp			
DEWI DVG			IN	ADEQUATE IADEQUATE			
REMARKS: THE IOA AND THE NASA ARE IN GENERAL AGREEMENT EXCEPT ON SCREEN B. THE IOA RECOMMENDS FAILURE OF SCREEN B DUE TO THE FAILED ITEM NOT BEING STANDBY REDUNDANT AND NOT BEING READILY DETECTABLE.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-874X		1	NASA DATA: BASELINE NEW	•
MDAC ID:	EMU 874 WAIST BEA	ARING			
LEAD ANALYST:	G. RAFFAE	ELLI			
ASSESSMENT:					
CRITICAL: FLIGHT HDW/FUI				c	CIL ITEM
·		on r n	A) []	P 1	(X)*
IOA [2 /1R] [F) [F		P]	[X] * [X]
COMPARE [/] [] [N] [1	[]
RECOMMENDATIONS:	(If dif	ferent fr	om NASA)		
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* CIL RETENTION I	RATIONALE:	(If appl	j	ADEQUATE ADEQUATE	[]
THE IOA AGREES WITHE REMAINDER OF			B AND I	S IN AGREE	EMENT WITH

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-648			NASA DATA BASELINE NEW	
	EMU 648 WAIST B	EARING			
LEAD ANALYST:	J. WHIT	MAN			
ASSESSMENT:					
CRITICAL: FLIGH		REDUNDA	NCY SCRE	ENS	CIL ITEM
	NC	A	В	С	IIEM
NASA [1 /1 IOA [2 /1R] [p]	[] [P]	[] [P]	[X] * [X]
COMPARE [N /N] [N]	[N]	[N]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	5A)	
[2 /1R] [P]	[P]		[] DD/DELETE)
* CIL RETENTION I	RATIONALI	E: (If a	pplicable	e) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AND THE I PLSS AND THE SOP LOSS OF LIFE. BI OF BOTH REDUNDANC AND A 2/1R CRITIC	AS REDUI ECAUSE A CIES, THI	NDANCIES SINGLE	WHICH MO EVENT (CA	T. THE IOA UST FAIL TO AUSE) CAN RE	CONSIDERS THE RESULT IN SULT IN LOSS

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-875X 104-FM14		BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 875 WAIST BEARING			
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICAL) FLIGHT		ANCY SCREENS	3	CIL ITEM
HDW/FUN		В	С	
NASA [2 /1R IOA [2 /1R] [P]] [P]	[F] [[F]	P] F]	[X] * [X]
COMPARE [/] []	[] [N]	[]
RECOMMENDATIONS:	(If differen	t from NASA))	
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REMARKS: THE IOA AND THE I IOA RECOMMENDS FA	NASA ARE IN AGR AILURE OF SCREE	EEMENT EXCEN N C DUE TO	PT FOR SCRI LIKE HARDW	EEN C. THI ARE BEING

SUSCEPTIBLE TO A COMMON CAUSE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-876X		NASA BASE	DATA: LINE [] NEW [X]
MDAC ID:	EMU 876 WAIST BEA	RING		
LEAD ANALYST:	G. RAFFAE	LLI		
ASSESSMENT:				
CRITICALI FLIGHT HDW/FUN	ŗ	EDUNDANCY B	SCREENS C	CIL ITEM
·		_	_	
NASA [2 /1R IOA [2 /1R] [P] [NA] [F] [P]] [P]	[X] * [X]
COMPARE [/] [] [и] []	[]
RECOMMENDATIONS:	(If dif	ferent fro	m NASA)	
[/] [] [] []	[] (ADD/DELETE)
* CIL RETENTION R	ATIONALE:	(If appli	cable) ADEQUA INADEQUA	
REMARKS: THE IOA AGREES WI THE REMAINDER OF	TH THE NAS	SA SCREEN SIS.	B AND IS IN A	AGREEMENT WITH

ASSESSME ASSESSME NASA FME	87 772 M1											DA ELI N		[]					
SUBSYSTEMDAC ID:	M:			EMU 877 WAISI	' Bl	EAF	RING														
LEAD ANA	LYS	ST	:	G. RA	FF	ΑEΙ	LLI														
ASSESSME																					
CRITICALITY FLIGHT HDW/FUNC							EDUNI	DA	NC	ey B	sc	REE	NS	c					I L TEI		
NASA		r	P	1		٢	N.A	1		٢	P	1			٢	х	1	*			
IOA	[2	/1R]	į	P	j		[NA F	j		į	P	j			Ì	X]	
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RECOMMEN	DA'	ΓI	ons:	(If	d:	if	fere	nt	f	rc	om	NAS.	A)	ı							
	[/]	[]		[]		[]		(A)		/ D1		ETE)
* CIL RE	IAL	E:	(If	a	PI	oli	ica					TAU TAU		[]					
THE IOA THE REMA				CR	E	EN	В	AND]	[S	IN	AG	RE:	EM	EN'	r v	HTIV				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-878X			NASA DATA: BASELINE NEW	: [
SUBSYSTEM: MDAC ID: ITEM:	EMU 878 WAIST BE	ARING			
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAL FLIGH	r	REDUNDANC	Y SCREEN	s	CIL ITEM
HDW/FU	NC 2	A	В	С	
NASA [2 /1R IOA [2 /1R] []	P] [P] [NA] [F] [P] F]	[X] * [X]
COMPARE [/] [] [и] [N]	[]
RECOMMENDATIONS:	(If di	fferent f	rom NASA)	
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* CIL RETENTION	RATIONALE	: (If app	licable)		
DEM DWG			I	ADEQUATE NADEQUATE	[]
REMARKS: THE IOA IS IN GEN	VERAL AGRI	Вемент ит	TH THE N	ASA FMFA FY	CEDT FOD
SCREEN C. IOA BI	ELIEVES A	CREDIBLE	COMMON	CAUSE SUCH	AS IMPACT OR
CORROSION CAN RES		OSS OF BO	TH THE P	IN AND THE	SECONDARY
RESIRAINI DRACKE.	L •				

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	* 8/06/87 EMU-879 104-FM1	X		NASA DATA: BASELINE NEW	[x]
SUBSYSTEM: MDAC ID: ITEM:	EMU 879 WAIST E	BEARING			
LEAD ANALYST:	G. RAFF	FAELLI			
ASSESSMENT:					
CRITICA		REDUNDANG	CY SCREENS	5	CIL ITEM
FLIC HDW/I		A	В	С	
NASA [2 /1 IOA [2 /1		[P] [[P] [NA] [F] [P] F]	[X] * [X]
COMPARE [/] (() [и] [N]	[]
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* CIL RETENTIO	RATIONA:	LE: (If ap		ADEQUATE NADEQUATE	[]
REMARKS: THE IOA AGREES BELIEVES A CRE	IBLE COM	MON CAUSE	CAN FAIL	NOT SCREEN BOTH THE RI	C. THE IOA EAR RESTRAINT

ASSESSMEN ASSESSMEN NASA FMEA	T ID	TE:	8/06/ EMU-8 104-F	80	X						NASA BASI	DATA ELINE NEW	[x]	
SUBSYSTEM MDAC ID: ITEM:	ſ:		EMU 880 WAIST	В	EA:	RING	ţ									
LEAD ANAI	YST:		G. RA	FF	AE:	LLI										
ASSESSMEN	T:															
C		R	EDUN	DAN	CY	SCF	REENS				IL Cem	ſ				
	HDW	/FUN	С		A			В		•	C					
NASA IOA	[1 ,	/1 /1]	[P]	[F]]]		[X X]	*
COMPARE	[,	/]	[N]	[N]	[)		[]	
RECOMMEND	ATIO1	NS:	(If	di	ifí	fere	nt :	fro	om N	ASA)						
	[]	[]	[]	(AI	[)D/	'DE] LE	TE			
* CIL RET REMARKS: THE IOA A										7	ADEQU ADEQU		[]	

ASSESSME ASSESSME NASA FME	EM	06/87 W-873 4-FM2	3 X										ASA BAS	ELI	NE	: [[X]				
SUBSYSTE MDAC ID: ITEM:				EM 87 BC		EAI		CL	J2O.	JR	E	(Ľ	TA	SII	DE))						
LEAD ANA	LYS	T:	;	G.	RAFI	FAE	EL	LI														
ASSESSME																						
	•	F	Œ	DU	NDA	M	CY	S	CRE	ENS	5				CII							
	Н	/FU	NC		7	7				В				С								
NASA IOA]	2 2	/1R /1R	!	[9]		[N F	A]		[[P P]			Ж] Ж]	[]	*	
COMPARE	[/]	1	[]		[N]		[]			[]	
RECOMMEN	DAT	'IC	ons:		(If o	lif	f	er	ent	t :	fr	om	NA	SA))							
	[/	3	1	[]		[]		[]		(A	[DD/E			TE)
* CIL RE	TEN	ΙΤΊ	ON	RAI	'IONA	LE:	;	(I	fa	ap	pl	ic	abl			DEQ DEO			[]	
REMARKS: THE IOA ANALYSIS			AS	A	SCI	RE:	EN	В	•								•	Œ				

ASSESSME ASSESSME NASA FME	NT	ID:	8/06/8 EMU-8: 104-FI	272									DATA LINE NEW	[]	
SUBSYSTE MDAC ID: ITEM:	М:		EMU 827 WAIST	ВІ	EAI	RING											
LEAD ANA	LYS	T:	G. RA	FFA	AEI	LLI											
ASSESSME	NT:																
		TICALI FLIGHT DW/FUN	r		RI A	EDUNI	DAN	CY B	SCRE	ENS	s C				I L PEI	M	
NASA IOA	[2 /1R 2 /1R]	[P P]]	F F]	[P P]		[X X]	*
COMPARE	[/]	[]	[]	[]		[]	
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* CIL RE	TEN	TION F	RATION	ALI	Ξ:	(If	ap	pl:	icable	•		DEQU DEQU		[]	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMEN ASSESSMEN NASA FME	T	ID		EMU-	10/86 -649 -FM21				ħ	IASA I BASEI		[]	
SUBSYSTEM MDAC ID:	M:			EMU 649 WAIS	ST BEAF	RING	;								
LEAD ANA	LYS	T:		J. 1	(AMTIHW	1									
ASSESSME	NT:														
	CRI			ITY	RI	EDUN	IDANCY	SCR	EENS			CII			
	F		IGH /FU	NC	A		В		•	С					
NASA IOA	[2	/2 /2]	[]] []	[[]		[]	ζ Κ]	*
COMPARE	[/]	. []	[]	[]		[]	
RECOMMEN	DA'	ric	ons:	(If dif	fere	ent fro	om N	IASA)						
	[/]	[]	[]	[1	(A	[DD/1	DE]	ETE)
* CIL RE	TE	NT:	ON	RATI	ONALE:	(I:	f appl	icak		ADEQU ADEQU		[]	
REMARKS: THE IOA	AN:	D !	THE	NASA	ARE I	n A	GREEME	NT.							

ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-650 NASA FMEA #: 104-FM22 SUBSYSTEM: EMU														A DA SELI N	NE	[x]		
SUBSYSTE MDAC ID:	M:			650		TOF	so	REST	'RA	INT,	/BLA	DD	ER	ASS	EM:	вL	Y			
LEAD ANA	LY	ST	:	J.	WHIT	CMA	N													
ASSESSME	NT.	:																		
•	IT:	ICAL LIGH	ITY T		R	ED	JNDAN	CY	SCF	REEN	s					IL PEN				
	HDW/FUNC								В			С				Δ.	LEP	1		
NASA IOA	[1 2	/1 /1R]	[P]]	P]	[P]			[X X]	*	
COMPARE	[N	/N]	[N]	[N]	[N]			[]		
RECOMMENI	ľAC	ľ	ONS:	()	If d	if	fer	rent	fro	om N	'ASA')								
	[2	/1R	J	ί	P]	[P]	[F]	((AE	[DD/	'DE] LF	CTE)
* CIL RET	EN	TI	ON F	OITAS	ONAL	E:	(I	f app	oli	cab	le)	ΑĽ	EQ	UATE	E	[1		
REMARKS:														UATE		[]		
THE IOA A THE REDUN ALSO FAIL EVENT CAN RECOMMEND	F	OR	I LOS	S OF	ED	BY FE	TH	E PLS	SS IR.	AND	SOF	A Per	ND	THA	T	EA	CH	30	***	

FAILURE OF SCREEN C AND A 2/1R CRITICALITY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-828X	NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 828 LOWER TORSO RES	TRAINT/BLADDER ASSEM	BLY
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICAL: FLIGH	ITY REDUNDA	NCY SCREENS	CIL ITEM
	NC A	В С	
NASA [2 /1R IOA [2 /1R] [P]] [P]	[NA] [P] [F] [P]	[X] * [X]
COMPARE [/] []	[и] [и]	[]
RECOMMENDATIONS:	(If different	from NASA)	
[/] []	[F] [] (A	[] DD/DELETE)
* CIL RETENTION	RATIONALE: (If a	pplicable) ADEQUATE INADEQUATE	
THE IOA RECOMMEN	DS FAILURE OF SC	RAL AGREEMENT EXCEPT REEN B TO REFLECT TH EM WHICH IS NOT STAN	E INABILITY

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-651			NASA DATA: BASELINE NEW					
	EMU 651 LOWER TOR	SO RESTRA	AINT/BLAD	DER ASSEMI	BLY				
LEAD ANALYST:	J. WHITMA	N							
ASSESSMENT:									
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM									
	NC A	. E	3	C					
NASA [2 /1R IOA [2 /1R] [P)	NA] []	P] P]	[X] * [X]				
COMPARE [/] [) [N	4] [1	[]				
RECOMMENDATIONS:	(If dif	ferent fr	com NASA)						
[/] [] [F	?] [) (AD	[] DD/DELETE)				
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []									
REMARKS: THE IOA AND THE NASA ARE IN GENERAL AGREEMENT EXCEPT FOR SCREEN B. THE IOA RECOMMENDS SCREEN B BE FAILED BECAUSE THE ITEM ITSELF IS NOT STANDBY REDUNDANT AND BECAUSE THE FAILURE IS NOT READILY DETECTABLE.									

ASSESSMENT DAT ASSESSMENT ID: NASA FMEA #:	EMU-6	51 A		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 651 LOWER	TORSO RI	ESTRAINT/B	LADDER ASSEM	BLY
LEAD ANALYST:	J. WH	ITMAN			
ASSESSMENT:					
FL]	ALITY GHT FUNC		DANCY SCRE	ENS C	CIL ITEM
·			_		
NASA [2 / IOA [2 /	1R] 1R]	[P] [P]	[NA] [F]	[P] [P]	[X] * [X]
COMPARE []	[]	[N]	[]	[]
RECOMMENDATION	s: (If	differe	nt from NA	SA)	
[/	3	[]	[F]	[] A)	[] DD/DELETE)
	N DAMION	ATEA /TE	annliaahl	o)	
* CIL RETENTION	N RATION	ALE: (II	applicabl	ADEQUATE INADEQUATE	
REMARKS: THE IOA AND THE B. THE IOA RE IS NOT STANDED DETECTABLE.	COMMENDS	SCREEN 1	B BE FAILE	EMENT EXCEPT D BECAUSE TH	FOR SCREEN E ITEM ITSEL

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-881X 104-FM26			ASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EMU 881 LOWER TOR	SO RESTRA	INT BLADDI	ER ASSEMI	BLY
LEAD ANALYST:	G. RAFFAE	LLI			
ASSESSMENT:					
CRITICAL: FLIGHT	r	EDUNDANCY			CIL ITEM
HDW/FUI	NC A	. В	С		
NASA [2 /1R IOA [2 /1R] [P] [NA	[P]	[X] * [X]
COMPARE [/] [] [N] []	[]
RECOMMENDATIONS:	(If dif	ferent fro	m NASA)		
. /] [] [] [] (AI	[] DD/DELETE)
* CIL RETENTION E	RATIONALE:	(If appli	AD	EQUATE EQUATE	[]
THE IOA AGREES WITHE REMAINDER OF			B AND IS	IN AGREE	MENT WITH

ASSESSMENT ASSESSMENT NASA FMEA	ID:	:	8/06/8 EMU-88 104-FM	2X						ASEL	ATA: INE NEW		x]	
SUBSYSTEM: MDAC ID: ITEM:			EMU 882 LOWER	TORS	SO RE	STR <i>I</i>	AINT	r BLAE	DE	R AS	SEMB	BLY			
LEAD ANALY	st:		G. RAF	FAE	LLI										
ASSESSMENT	:														
CF			[TY	R	EDUND	ANC!	Y S	CREENS	3			CI	L EM	ĺ	
		IGHT /FUI	1C F.	A		1	В		С						
NASA IOA	[2 [2	/1R /1R]	[P]	[]	NA] F]	[P P]		[X X]	*
COMPARE	[/	1	[1	[:	и]	[1		[]	
RECOMMEND	ATIC	NS:	(If	dif	feren	ıt f	rom	NASA)						
	[/]	[]	[3	[}	· (A		/DI		ETE)
* CIL RET	ENTI	ON	RATION	ALE:	(If	app	lic				ATE ATE]	
REMARKS: THE IOA A THE REMAI	GREI NDEI	ES W	THE A	E NA	SA SO	CREE	N E	AND	IS	IN	AGRE	EM	EN!	r v	VITH

REPORT DATE 02/25/88 C-151

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-883X 104-FM28				ASA DATA BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	EMU 883 LOWER TOR	SO RESTR	AINT B	LADD	ER ASSEM	BLY	
LEAD ANALYST:	G. RAFFAE	LLI					
ASSESSMENT:							
CRITICALI FLIGHT		EDUNDANC	SCRE	ENS		CIL	
HDW/FUN	C A	I	3	С		ITE	M
NASA [3 /3 IOA [3 /3] [] []]]	[] *]
COMPARE [/] [] []	[]	[]
RECOMMENDATIONS:	(If diff	ferent fr	om NA	SA)			
[/] [] []	C	-	[DD/DE] ELETE)
* CIL RETENTION RATE REMARKS:	ATIONALE:	(If appl	icable	AD	EQUATE EQUATE	[]
THE IOA AND THE NA	ASA ARE IN	AGREEME	NT.				

ASSESSMEN ASSESSMEN NASA FMEA	T	I):	12/1 EMU- 104-	652								ASA DAT BASELIN NE]	
SUBSYSTEM MDAC ID: ITEM:	1:			EMU 652 BOOT	DI	sc	ONNE	CT									
LEAD ANAI	YS	T:	1	J. W	HITI	MAI	1										
ASSESSMEN	T:																
C		FI	LIGHT				EDUN	DAN		SCF	REEN				IL TEI		
	Н	DW	/FUI	1C		A			В			С					
NASA IOA	[[1 2	/1 /1R]	[[P]	[P]	[P]	[[X X] *]	•
COMPARE	[N	/N]	[N]	[N]	[N]	[]	
RECOMMEND	PΑT	'IC	NS:	(I	f d:	if	fere	nt	fro	a mc	IASA)					
	[2	/1R]	[P]	[P]	[F] ADD	/D1] ELEI	E)
* CIL RET	EN	TI	ON I	RATIO	NAL	E:	(If	ap	pli	icab	•		DEQUATE DEQUATE]	
REMARKS: THE IOA A	W	TH	IE NA	ASA A	RE 1	NO	r in	AG	REI	EMEN			HE IOA	-		DERS	TH

PLSS AND SOP AS REDUNDANT FUNCTIONS FOR PRESSURIZATION AND EACH MUST BE LOST TO RESULT IN LOSS OF LIFE WHEN THIS FAILURE OCCURS. BECAUSE A SINGLE EVENT CAN OCCUR WHICH CAN CAUSE LOSS OF ALL REDUNDANCIES, THE IOA RECOMMENDS FAILURE OF SCREEN C AND A 2/1R CRITICALITY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-657		NASA DATA: BASELINE NEW	
MDAC ID:	EMU 657 BODY SEAL	. CLOSURE (LTA SII	DE)	
LEAD ANALYST:	J. WHITMA	M		
ASSESSMENT:				
CRITICAL FLIGH		REDUNDANCY SCREENS	;	CIL ITEM
HDW/FU	NC A	В	С	
NASA [3 /2R IOA [2 /2] [P) [P] [P]	[x] *
COMPARE [N /N) [N	[и] [и]	и ј	[N]
RECOMMENDATIONS:	(If dif	ferent from NASA)		
[2 /2	J [] [] [] (AI	[A] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If applicable)		
		II	ADEQUATE IADEQUATE	[]
REMARKS:	THE PEVE	BAR" TO SUPPORT DO	FFING A "I	TATLED MATED
LTA-TO-HUT WOULD	DAMAGE TH	HE MECHANISM, THE	SUIT WOULD	D BE UNUSABLE
		EREFORE, THE IOA P		

ASSESSMEN ASSESSMEN NASA FMEA	T I	D:		8/06/ EMU-8 104-F	30X							ASA D BASEL		[
SUBSYSTEM MDAC ID: ITEM:	i :			EMU 830 BOOT	DIS	co	NNEC'	Г								
LEAD ANAI	YSI	Γ:		G. RA	\FF#	EL	LI									
ASSESSMEN	T:															
(ricz FLIC DW/1	GHT			RE A	DUND	ANC	CY B	SCRE	ENS C			CII		
W3.63		•			г		1	r	NZ	11	rF)]		ſ)	()	*
NASA IOA	[:	2 /: 2 /:			[P]	[F)	[F	· j		[]	(j	
COMPARE	[/]	[]	[N]	[3		[]	
RECOMMEN	DAT:	ION	s:	(I:	f d:	ifí	feren	t:	fro	om NA	SA)					
	[/]	[]	[F]	[3	(Al	[DD/1	DEL	ETE)
* CIL RE	TEN'	TIO	N F	RATIO	NAL	Ε:	(If	ap	pl:	icabl	7	ADEQU <i>I</i> ADEQU <i>I</i>		[]	
REMARKS:	a ar D	mu	י מי	1262	A D F	T	J ACE	सम	MEI	NT EX	CEP	r on s	CRE	EN :	в.	THE

THE IOA AND THE NASA ARE IN AGREEMENT EXCEPT IOA RECOMMENDS FAILURE OF SCREEN B BECAUSE THE FAILURE IS NOT READILY DETECTABLE AND THE ITEM FAILING IS NOT STANDBY REDUNDANT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-867X 104-FM31		NASA DATA: BASELINE NEW	=
SUBSYSTEM: MDAC ID: ITEM:	EMU 867 BOOT DISCONNECT			
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICALI FLIGHT	?	NCY SCREENS	3	CIL ITEM
HDW/FUN	IC A	В	С	
NASA [2 /1R IOA [2 /1R] [P]] [P]	[NA] [[F] [P] P]	[X] * [X]
COMPARE [/] []	[и]]	[]
RECOMMENDATIONS:	(If different	from NASA)		
[/] [] [F) [[] D/DELETE)
* CIL RETENTION R	ATIONALE: (If ap	•	ADEQUATE	£ 1
REMARKS:		IN	ADEQUATE	[]
THE IOA AND THE N IOA RECOMMENDS FA READILY DETECTABL	ILURE OF SCREEN	B BECAUSE	THE FATTIO	F TC NOT

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-654		NASA DATA: BASELINE NEW						
SUBSYSTEM: MDAC ID: ITEM:	EMU 654 PRESSURE B	OOT ASSEMBLY							
LEAD ANALYST:	J. WHITMAN								
ASSESSMENT:									
CRITICALITY REDUNDANCY SCREENS CIL									
FLIGH HDW/FU		В	С						
NASA [2 /1R IOA [2 /1R] [P]] [NA]] [P]	[P] [P]	[X] *					
COMPARE [/] [] [N]	[]	[]					
RECOMMENDATIONS:	(If diff	erent from NAS	A)						
[/] [] [F]	[] (AI	[] DD/DELETE)					
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []									
REMARKS: THE IOA AND THE NASA ARE IN AGREEMENT EXCEPT ON SCREEN B. THE IOA RECOMMENDS FAILURE OF SCREEN B BECAUSE THE FAILURE IS NOT READILY DETECTABLE AND THE ITEM FAILING IS NOT STANDBY REDUNDANT.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-654A 104-FM33		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 654 PRESSURE BOO	OT ASSEMBLY		
LEAD ANALYST:	J. WHITMAN			
ASSESSMENT:				
CRITICAL: FLIGHT		UNDANCY SCREENS	1	CIL
HDW/FUI		В	С	ITEM
NASA [2 /1R IOA [2 /1R] [P]] [P]	[NA] [[P] [P] P]	[X] * [X]
COMPARE [/] []	[и] [1	[]
RECOMMENDATIONS:	(If differ	rent from NASA)		
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* CIL RETENTION H	RATIONALE: (1		ADEQUATE	į j
REMARKS: THE IOA AND THE MIOA RECOMMENDS FA	LILURE OF SCR	AGREEMENT EXCEP REEN B BECAUSE	THE FAILUR	N B. THE E IS NOT
READILY DETECTABI	E AND THE IT	TEM FAILING IS	NOT STANDB	Y REDUNDANT.

ASSESSMEN ASSESSMEN NASA FMEA	T]	D:		EM	/10/80 J-653 4-FM3							_	SASEI		[]	
SUBSYSTEM MDAC ID: ITEM:	i :			EMU 65: PRI		E E	300T	ASS	SEN	MBLY								
LEAD ANAL	YST	r:		J.	WHIT	IAN	1											
ASSESSMEN	T:																	
c			CALI			RI	EDUN	DAN	CY	SCRI	EENS	5			C]	L CEM	ſ	
	HI	W/	/FUN	IC		A			В			С						
NASA IOA	[;	1 / 2 /	/1 /1R]	. (P]	[P]]	P]		[X]	*
COMPARE	[]	N /	/N]	[N]	[N]	[N	3		[]	
RECOMMEND)AT	101	NS:		(If d	if:	fere	ent :	fro	om Ni	ASA))						
	[:	2 ,	/1R]	[P	1	[P)	[F]	(A	[DD,	/DI] ELE	TE)
* CIL RET	CEN'	TIC	I NC	RAT	IONAL	E:	(If	ap	pl:	icab:		Al	DEQU	ATE	[]	
REMARKS:		•				37	от т	FNT 7.	c D	PPMPI			DEQU		-	JC 1		חדם

THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA CONSIDERED THE PLSS AND THE SOP TO BE REDUNDANT FUNCTIONS WHICH MUST ALSO FAIL FUNCTIONALLY TO CAUSE LOSS OF LIFE. THE IOA RECOGNIZES THAT THE FAILURE MUST BE EXTREMELY SEVERE TO CAUSE LOSS OF THESE FUNCTIONS AND TO ADDRESS THE POSSIBILITY THAT A SINGLE EVENT CAN REUSLT IN FUNCTIONAL FAILURE OF ALL REDUNDANCIES, THE IOA RECOMMENDS A 2/1Rc CRITICALITY.

ASSESSME ASSESSME NASA FME	TNE											EL.	ATA INE NEW	[x]					
SUBSYSTE MDAC ID:				EI 80 PI		UR:	E :	BOOT	ΓA	.ss:	EN	MBLY									
LEAD ANA	LYS	ST	:	G.	RA	FF.	AE:	LLI													
ASSESSME	NT:	:																			
		F	ICAI LIGH W/FU	T	Z.		Ri A		NDA		Y B	SCRI	EEN:	s c				CI II	L El	ч	
NASA IOA	[2	/1F /1F	2]		[P P]		[]	e e]	[P P]			[X X]	*
COMPARE	[/]		[]		[]	[]			[]	
RECOMMEN	DAT	CIC	ons:		(If	d:	if	fere	ent	fı	cc	om NA	ASA)							
	[/]		[]		[]	[]		(AI	[OD/	'DE] ELF	ETE)
* CIL RE REMARKS: THE IOA													•			UAT TAU		[]	
		- 4		-1210	** **	~	-1	, no	11/10	LILL	17.4	.									

ASSESSME ASSESSME NASA FME	ΝT	II		E	/06/8 MU-83 04-F1	312								ì		DA' ELI: N		[x]	
SUBSYSTE MDAC ID:				8	MU 31 RESS	JRI	E I	300'	ΓA	ss	EM	IBL\	ď								
LEAD ANA	LYS	ST	:	G	. RA	FFZ	AEI	LLI													
ASSESSME	ENT	:																			
		F	ICA LIG W/F	ΗT			RI A	EDU	NDA	MC	EY B	SCI	REEN		c			CI	L EN	1	
NASA IOA						[P]		[F]		[]	P]			[X X]	*
COMPARE	[N	/N			[N]		[N]	1	[]	N]			[]	
RECOMME	NDA'	TI	ons	:	(If	d	if	fer	ent	: 1	fro	om I	NASZ	A)							
	[/	•	l	[]		[]	i	[)		(A	[DD/	/DI] ELI	ETE)
* CIL RI		NT	ION	R.	ATION	AL	E:	(I	fa	app) 1:	ical				TAUÇ TAUÇ		[]	
REMARKS	:																				

THE IOA AGREES WITH THE NASA ANALYSIS.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-832X			IASA DATA BASELINE NEW]
MDAC ID:	EMU 832 PRESSURE	BOOT ASSE	MBLY			
LEAD ANALYST:	G. RAFFAE	LLI				
ASSESSMENT:						
CRITICALI FLIGHT	ITY R	EDUNDANCY	SCREENS		CIL	ſ
HDW/FU	NC A	В	c			-
NASA [3 /3 IOA [2 /2] [] [] []	[] *
COMPARE [N /N] [] [] []	[]
RECOMMENDATIONS:	(If dif	ferent fro	om NASA)			
[2 /2] [] [] [[A DD/DE] LETE)
* CIL RETENTION F	RATIONALE:	(If appli	•			
REMARKS:				DEQUATE DEQUATE]
IN ADDITION TO LO POSSIBILITY THAT	AN ABRADEI	D SOLE COU	LD MAKE	USE OF FO	TO	
RESTRAINTS A DIFF OR SEVERE DISCOMF	COLT OR TORE	IMPOSSIBLE IS, THE MI	TASK.	IF UNABLE Y HAVE TO	TO BE	BE USED

THE IOA THEREFORE RECOMMENDS A 2/2 CRITICALITY AND INCLUSION IN THE CIL.

REPORT DATE 02/25/88 C-162

ASSESSMEN ASSESSMEN NASA FME	I TN	D:	12/10/ EMU-65 104-FM	55					ASA DA BASELI N	NE	[x]	
SUBSYSTEM MDAC ID:	M:		EMU 655 BOOT S	SIZIN	IG IN	SERT							
LEAD ANA	LYSI	?:	J. WHI	(AMT	1								
ASSESSME	NT:												
		CICAL		RI	EDUND	ANCY	SCRE	ENS			CIL	M	
		W/FU		A		В		C	•				
NASA IOA	[3	3 /3]	[]	[]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	(If	dif	feren	t fr	om NAS	SA)					
	[/]	[1	[]	[]	(AI	[DD/D:] ELI	ETE)
* CIL RE	TENI	TION :	RATION	ALE:	(If	appl	icable	P	DEQUAT		[]	
REMARKS:													

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMI ASSESSMI NASA FMI	ENT	Ι		EM	06/87 U-835X 4-FM39				1	IASA BASE	LINE	-] X]	
SUBSYSTE MDAC ID:				EM 83: BO		NG	INSERT							
LEAD ANA	LY	ST	:	G.	RAFFAE	LLI								
ASSESSME	ENT	:												
	CR		ICAI LIGI	LITY	R	EDU:	NDANCY	SCI	REENS			CII		
	1		/F		A		В		C	!		7.1.1	214	
NASA IOA	[3	/3 /3]	[[]	[]	[]		[]	*
COMPARE	[/]	[)	[]	[]		[]	
RECOMMEN	DA'	ric	ONS:	; ((If dif:	fer	ent fr	om N	IASA)					
	[/]	[]	[]	[]	(A)	[DD/E) ELF	ETE)
* CIL RE REMARKS: THE IOA									A	DEQU <i>I</i>		[]	
TON	- ALT L	- 1	بندد.	MUDE	r uve Ti	, W	3 NC CNC!	4 T.						

ASSESSMEN ASSESSMEN NASA FME	T I	[D:	12/10/ EMU-65 104-FM	6]	NASA DATI BASELINI NEI	E	[X	-	
SUBSYSTEM MDAC ID: ITEM:	ſ:		EMU 656 BODY S	EAL	closu	RE ((LTA S	ID	E)				
LEAD ANA	LYS:	r:	J. WHI	TMAN	İ								
ASSESSME	T.												
•		TICAL:		RE	DUNDA	NCY	SCREE	NS			CIL ITE	M	
		FLIGH' DW/FU		A		В			С				
NASA IOA	[2 /2 2 /2]	[]	[]	[]		[X]	*
COMPARE	[/	1	ι]	[3	[1		[]	
RECOMMEN	DAT	ions:	(If	difi	ferent	: fr	om NAS	SA)					
	[/]	[]	[]	[] (ΑD	[D/D		TE)
* CIL RE	TEN	TION	RATION	ALE:	(If a	appl	icable		ADEQUATE NADEQUATE		[]	
REMARKS: THE IOA	AND	THE	NASA A	RE I	n AGRI	EEME	NT.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-856X				1	IASA DATA BASELINI NEV]	
SUBSYSTEM: MDAC ID: ITEM:	EMU 856 WAIST/BR	IEF/LT	'A/BC	IT TO	Y G					
LEAD ANALYST:	G. RAFFAI	ELLI								
ASSESSMENT:										
CRITICALI FLIGHT	TY F	REDUND	ANCY	SCRE	EENS		CII			
HDW/FUN	IC A	1	В		С		ITI	LM		
NASA [3 /3 IOA [2 /2] []	[]	[]	[}] []	*	
COMPARE [N /N] []	[]	[]	[]	[]		
RECOMMENDATIONS:	(If dif	ferent	t fr	om NA	SA)					
[2 /2] []	[]	[[A DD/D		ÆTE)	
* CIL RETENTION R	ATIONALE:	(If a	appl	icabl						
REMARKS:					AI INAI	DEQUATE DEQUATE	[]		
THE IOA CONSIDERE CAUSE SIGNIFICANT IMPACTED. THE IO INCLUSION IN THE	CKEWPERS A, THEREF	ORE. F	COMI	FORT (SUCH	TOTTE TO TOTTE		~ ~		

ASSESSMEN ASSESSMEN NASA FMEA	T T	D:	8/06, EMU- 104-	884X					ASA BASE	LINE NEW	[]	
SUBSYSTEM MDAC ID: ITEM:	1:		EMU 884 WAIS	r/BRI	EF/L	TA/BO	o T T	MG					
LEAD ANA	LYSI	P:	G. R	AFFAE	LLI								
ASSESSME	T:												
(rical FLIGH	ITY	R	EDUN	DANCY	SCR	EENS			CIL		
	_	OW/FU		A		В		C	:		-		
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* CIL RE	TEN'	TION	RATIC	NALE:	(If	appl	icab	1		JATE JATE]	
REMARKS: THE IOA	AND	THE	NASA	ARE I	N AC	REEME	NT.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMII-650			NASA DATA BASELINE NEW	
MDAC ID:		AL CLOSUR	E (LTA SII	DE)	
LEAD ANALYST:	J. WHIT	MAN			
ASSESSMENT:					
FLIGH	ITY T NC		CY SCREENS B	c	CIL ITEM
NASA [3 /1R IOA [2 /1R] [P] [P] [F] [P] [P] P]	[] *
COMPARE [N /] [] [и ј []	[N]
RECOMMENDATIONS:	(If di	ifferent 1	from NASA)		
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THE IOA ANALYSIS REQUIREMENT AS RI DOES ACCEPT IT A	EDUNDANT;	HOWEVER.	UPON FUR	THER REVIE	TIONAL W, THE IOA

ASSESSME ASSESSME NASA FME	NT I	[D:	8/06/ EMU-8 104-F	85X						DATA: LINE NEW			
SUBSYSTEM MDAC ID:	M:		EMU 885 DONNI	NG A	ID H.	ANDLE	s						
LEAD ANA	LYS	Г:	G. RA	FFAE	LLI								
ASSESSME	ASSESSMENT: CRITICALITY PEDUNDANCY SCREENS												
CRITICALITY REDUNDANCY SCREENS FLIGHT													
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* CIL RE																	UAT:		[]	
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SUBSYSTE MDAC ID:	M:		EMU 855 DONNI	ng A	ID H	IANDLE	S				
LEAD ANA	LYSI	r:	G. RA	FFAE	LLI						
ASSESSME	NT:										
		CICAL:		R	EDUN	IDANCY	SCR	EENS		CII	
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COMPARE	[/]	[N]	[N]	[N]	[]
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LEAD ANA	LYSI	?:	G. RA	FF <i>I</i>	AEI	LLI													
ASSESSME																			
(FLIGHT															IL CEN	4		
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-646	NASA DATA: BASELINE [NEW [X]
	EMU 646 WAIST RESTRAINT AND BLA	DDER	
LEAD ANALYST:	J. WHITMAN		
ASSESSMENT:			
CRITICAL FLIGH	ITY REDUNDANCY SCRE	ENS CIL ITEM	
HDW/FU	NC A B	С	
NASA [1 /1 IOA [2 /1R		[] [X [X]] *]
COMPARE [N /N] [N] [N]	[и]]
RECOMMENDATIONS:	(If different from NA	SA)	
[2 /1R] [P] [P]	[F] [(ADD/DE] LETE)
* CIL RETENTION	RATIONALE: (If applicable	e) ADEQUATE [INADEQUATE []
PLSS AND THE SOP	NASA ARE NOT IN AGREEMEN AS REDUNDANT FUNCTIONS FE WITH THIS FAILURE MOD	T. THE IOA CONSI	LED TO
	E EVENT CAN RESULT IN LO		

IOA RECOMMENDS A 2/1Rc CRITICALITY.

ASSESSMENT DA ASSESSMENT ID NASA FMEA #:	: EMU-6	22]	NASA DATA BASELINE NEW]				
SUBSYSTEM: MDAC ID: ITEM:	EMU 622 HELME	T AS	SEMBLY	Z									
LEAD ANALYST:	J. WH	ITMA	N										
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C													
		A		В		C	2	116	M				
NASA [1]	/1] /1R]	[[P]	[[P]	[[I]	x] x]] *				
COMPARE [N	'N]	[N]	[N]	[]	1]	[]				
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REMARKS: BECAUSE A SEVI ORAL/NASAL VEI IOA AGREES WIT	TILATION	IN A	ADDITI	ON '									

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SUBSYSTE MDAC ID: ITEM:			EMU 809 HEL		EMBL	Y										
LEAD ANA	LYST	? :	G.	RAFFAEI	LI											
ASSESSME	ENT:															
				RE	DUND	ANC	Y	SCI	REENS	;		CI IT		ſ		
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COMPARE	[/]	[]	[N]	ξ]	[]		
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REMARKS: THE IOA FURTHER	AND	THE	NASA THE	ARE II	N AGF REES	REEI WI:	MEI CH	TH	EXCEI E NAS	PT SA	ON SCRE	EN BA	B.	SIC	UPON SNMENT	! •

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LEAD ANA	LY	ST	:	G.	RAFFAE	LLI									
ASSESSME	NT	:													
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SUBSYSTE MDAC ID: ITEM:	M:			EMU 886 HEI		SSEME	BLY								
LEAD ANA	LYS	T:		G.	RAFFAI	ELLI									
ASSESSME	NT:														
CRITICALITY REDUNDANCY SCREENS FLIGHT													L EM	,	
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LEAD AND	ALY	ST	:	G.	RAFFAE	LLI									
ASSESSMI	ENT	:													
	CRITICALITY REDUNDANCY SCREENS FLIGHT													м	
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SUBSYSTEM MDAC ID:	M:		EMU 620 COI		ľAI	ric	ON E	PUR	GE	7	/AL	VE									
LEAD ANA	LYST	? :	J.	WHI	T	(A)	1														
ASSESSME	NT:																				
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COMPARE	[/N	3		[]		[N]		[]			[N]	
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REMARKS:																					

THE IOA AGREES WITH THE NASA ANALYSIS.

ASSESSMI ASSESSMI NASA FMI	ENT :	ID:	EMU-	521								ASA DA: BASELII NI	1E	[[x				
SUBSYSTI MDAC ID: ITEM:			EMU 621 COMB	[NA'	ric	on pi	JRG:	E	VALV	Æ								
LEAD ANA	ALYST	Γ:	J. WH	HITI	IAN	Ŋ												
ASSESSME	ENT:																	
		CICAL	ITY T		RI	EDUNI	OAN	CY	SCR	REENS	5			CIL ITE				
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COMPARE	[/N]	[Ŋ]	[N]	[N]		[3			
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* CIL RE	TENT	'ION F	RATION	ALE	:	(If	app	1:	icab	•	AI	EQUATE		[]			
REMARKS: THE IOA REDUNDAN ADDITION THIS FAI	T PR ALLY	ESSUF , THE	RE CON E IOA	TRC	L	ELEM	ENT	rs.	IN '	O RE	FI	CENARI	ILU O.	JRE	OF		INTO	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/8 EMU-637 106-FM1	6		NASA DATA BASELINE NEW	[]
	EMU 637 RESTRAI	NT MODIF	'IED			
LEAD ANALYST:	J. WHIT	MAN				
ASSESSMENT:						
CRITICAL FLIGH		REDUNDA	NCY SCREE	ens	CIL	
HDW/FU		•				
NASA [3 /2R IOA [2 /2] [P] NA]	[F] [NA]	[P] [NA]	[X] *
COMPARE [N /N] [N]	[N]	[N]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	3 A)		
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* CIL RETENTION :	RATIONAL	E: (If a	applicable	e) ADEQUATE INADEQUATE]
THE IOA AGREES W	ITH THE	NASA ANA	LYSIS.			

ASSESSMI ASSESSMI NASA FMI	CNT	I	D:	12/10, EMU-64 106-FI	12									ASA DATA BASELINE NEW	. [x]	
SUBSYSTE MDAC ID:				EMU 642 WRIST	D.	IS	CONNE	CI	•	(0	SLOVE	s	ID	E)				
LEAD ANA	LY	ST	:	J. WH	[T]	MAI	1											
ASSESSME	ENT	:																
		F	LIGH'				EDUND	ΑN			SCRE	EN	S			IL PEN	1	
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NASA IOA	[1 2	/1 /1R]]	P]	[P]	[P]	[[X X] *]	
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RECOMMEN	IDA'	TI(ons:	(If	d:	if	feren	t	f	rc	m NA	SA)					
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REMARKS: THE IOA THE FACT	AN																	

HARDWARE AND SOP/PLSS FUNCTIONS. TO IDENTIFY LOSS OF ALL FUNCTIONAL REDUNDANCIES FROM A COMMON CANCEL TO THE PROPERTY OF THE P FUNCTIONAL REDUNDANCIES FROM A COMMON CAUSE, THE IOA RECOMMENDS A 2/1Rc ASSIGNMENT.

ASSESSMEN ASSESSMEN NASA FMEA	T I	D:	8/06/3 EMU-8: 106-F	22X					ASA DA' BASELII N	NE		_	
SUBSYSTEM MDAC ID: ITEM:	ſ:		EMU 822 WRIST	DIS	CONNI	ECT (GLOVE	SIDI	E)				
LEAD ANAI	LYST	:	G. RA	FFAE:	LLI								
ASSESSMEN	T:												
C	F	ICALI LIGHT W/FUI	r	R: A		DANCY B	SCREI	ens C			CIL		
NASA IOA		·]	[P]	[F]	[P]		[X]	*
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REMARKS:													

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-823X		NASA DATA BASELINE NEW	: [
MDAC ID:	EMU 823 WRIST DISCON	NECT (GLOVE	SIDE)	
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICALI FLIGHT	ITY REDU	NDANCY SCREE	NS	CIL
	IC A	В	С	ITEM
NASA [3 /2R IOA [2 /2] [P]] [P]	[P] [F]	[P] [P]	[] *
COMPARE [N /N] []	[N]	[]	[N]
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REMARKS: FOR THE WORST CAS OF MISSION ESSENT TERMINATION.	E, LOSS OF T	ETHERED OBJECT AND, THEREF	CTS CAN RESU CORE, MISSIC	ULT IN LOSS ON

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-643 106-FM13					ASA DATA BASELINI NEV	E (x]
	EMU 643 WRIST DISC	ONNEC	т (С	LOVE	SID	Ε)			
LEAD ANALYST:	J. WHITMAN	ī							
ASSESSMENT:									
CRITICAL		DUNDA	NCY	SCREE	ns			CIL	
FLIGHT HDW/FUI			В		С		•		•
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RECOMMENDATIONS:	(If diff	ferent	fro	om NAS	SA)				
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ASSESSME ASSESSME NASA FME	ENT	I		EMU	10/86 -645 -FM14						DATA ELINE NEW	[]	
SUBSYSTE MDAC ID:				EMU 645 PAL		RAI	NT								
LEAD ANA	LY	ST	:	J.	WHITMA	N									
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REMARKS: THE IOA	ANE	r (HE	NASA	ARE IN	V AC	GREEMEI	NT.				•		,	

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SUBSYSTEM MDAC ID: ITEM:	м:		EMU 644 PALM	RESTI	RAINT							
LEAD ANA	LYSI	r:	J. WH	ITMAI	N							
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SUBSYSTE MDAC ID:				EMU 859 GLO		MG														
LEAD ANA	LYS	ST	:	G.	RAFF	AE:	LLI													
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SUBSYSTE MDAC ID:				EM 86 GL		'MG													
LEAD ANA	LY	ST	:	G.	RAFF	ΆE	LLI												
ASSESSME	NT	:																	
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SUBSYSTEM: MDAC ID: ITEM:	EMU 640 RESTRA	INT MODIFI	ED		
LEAD ANALYST:	J. WHI	TMAN			
ASSESSMENT:					
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	EMU 639 RESTRAINT MO	DIFIED		
LEAD ANALYST:	J. WHITMAN			
ASSESSMENT:				
CRITICAL FLIGH	ITY REDU	NDANCY SCRE	EENS	CIL ITEM
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LEAD ANA	LYS	ST	:	G. RA	FFAE	LLI								
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LEAD ANALYST:	J. WHITMAN		
ASSESSMENT:			
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REMARKS:

THE IOA AND THE NASA ARE NOT IN AGREEMENT. THE IOA CONSIDERS THE PLSS AND SOP AS REDUNDANCIES WHICH MUST ALSO BE FAILED TO RESULT IN LOSS OF LIFE. TO REFLECT A CAUSAL EVENT WHICH MAY ALSO RESULT IN LOSS OF REDUNDANCIES AND THEREBY LOSS OF LIFE, THE IOA RECOMMENDS A 2/1Rc CRITICALITY.

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THE IOA AGREES WITH THE NASA ANALYSIS.

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SUBSYSTEM: MDAC ID: ITEM:		EMU 888 RESTR	TNI	ASSEN	IBLY							
LEAD ANALYS	ST:	G. RAI	FFAEI	LLI								
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REPORT DATE 02/25/88 C-201

ALSO RESULTS.

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REMARKS .									X011T	L	7	

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/86 EMU-665 107-FM13		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 665 VENT MANIFO	OLD AND DUCTS		
LEAD ANALYST:	J. WHITMAN			
ASSESSMENT:				
CRITICA		DUNDANCY SCREE	NS	CIL ITEM
FLIG HDW/F	UNC A	В	С	
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REMARKS: THE IOA AND THE	NASA ARE IN	AGREEMENT.		

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SUBSYSTE MDAC ID:			EMU 839 MULT	PLE	CONI	NECTOR	R (L0	CVG H	ALF)		
LEAD ANA	LYS	ST:	G. F	AFFAE	LLI						
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SUBSYSTEM: EMU MDAC ID: 667 ITEM: MULTIUPLE CONNECTOR (LCVG HALF) LEAD ANALYST: J. WHITMAN	
LEAD ANALYST: J. WHITMAN	
ASSESSMENT:	
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM	
HDW/FUNC A B C	
NASA [3 /3] [] [] [X] IOA [3 /3] [] [] [X]	*
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RECOMMENDATIONS: (If different from NASA)	
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* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []	

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MDAC ID:	EMU 668 MULTIUPLE	CONNEC	TOR (LO	VG HALF)	
LEAD ANALYST:	J. WHITMA	7N				
ASSESSMENT:						
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SUBSYST MDAC ID				EM 66: RES		AS	SEMBLY							
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LEAD ANA	LYS	T:		G. RA	AFFAE]	LLI								
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SUBSYSTEM: MDAC ID: ITEM:	EMU 662 RESTRAINT ASSEMBLY		
LEAD ANALYST:	J. WHITMAN		
ASSESSMENT:			
CRITICALI FLIGHT	TTY REDUNDANCY S	SCREENS	CIL ITEM
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ASSESSMENT DATE: 8/06/87 ASSESSMENT ID: EMU-862X NASA FMEA #: 107-FM8 SUBSYSTEM: EMU														A DAT SELIN NE	Ε [х]	
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SUBSYSTEM: MDAC ID: ITEM:	EMU 812 EVVA				
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-626 108-FM7	NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 626 EXTRAVEHICULAR V	ISOR ASSEMBLY	
LEAD ANALYST:	J. WHITMAN		
ASSESSMENT:			
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-891X 108-FM9	NASA DATA BASELINA NEV	Ξ []
SUBSYSTEM: MDAC ID: ITEM:	EMU 891 EXTRAVEHICULAR	VISOR ASSEMBLY	
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
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LEAD ANALY	ST:	J. WHI	TMAN	Ī								
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-671 110-FM4		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 671 BLADDER ASS	EMBLY		
LEAD ANALYST:	J. WHITMAN			
ASSESSMENT:				
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SUBSYSTEM: MDAC ID: ITEM:	EMU 672 BLADDER A	SSEMBI	ĽΥ							
LEAD ANALYST:	J. WHITMA	N								
ASSESSMENT:										
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REMARKS:									-		

THE IOA AGREES WITH THE NASA ANALYSIS.

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RECOMMEN	DAT	ions:	(If	dif	fere	nt fr	om N	ASA)					
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ASSESSMEN ASSESSMEN NASA FME	NT I	D:	12/10/ EMU-24 111-FN	16		NASA DATA: BASELINE [] NEW [X]							
SUBSYSTEM MDAC ID:	M:		EMU 246 PRIMAN	RY O	XYGEN	I BOT	rles	(ITE	M 111)-Q	TY-2			
LEAD ANA	LYSI	?:	G. RAI	FAE	LLI								
ASSESSME	NT:												
(F	CICALI FLIGHT	נ	Ri A		DANCY B	SCRE	ENS C		CIL			
NASA IOA	[2	2 /1R 2 /1R]	[P]	[P]	[P]	[X [X	*		
COMPARE	[/]	[]	[]	[]	[]		
RECOMMEN	DATI	ons:	(If	dif	ferer	nt fr	om NA	SA)					
	[/]	[]	[]	[] (A	[DD/D] ELETE)		
* CIL RE	TENT	rion i	RATION	ALE:	(If	appl.	icabl	A	DEQUATE DEQUATE]		
REMARKS:													

12/10/86 EMU-249 112-FM1			BASELINE	: [x]
EMU 249 PRIMARY O	2 PRESSUR	RE SENSOR	(ITEM 11:	2)
G. RAFFAE	LLI			
ITY R	EDUNDANCY	SCREENS		CIL ITEM
NC A	. E	c c		
] [] [P] [] [F] [P]	[X] * [X]
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(If dif	ferent fr	om NASA)		
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		A		[]
	EMU-249 112-FM1 EMU 249 PRIMARY O G. RAFFAE ITY R NC A] [P] [N (If dif] [RATIONALE:	EMU-249 112-FM1 EMU 249 PRIMARY O2 PRESSUR G. RAFFAELLI ITY REDUNDANCY NC A B [] [] [F] [N] [N (If different fr] [] [EMU-249 112-FM1 EMU 249 PRIMARY O2 PRESSURE SENSOR G. RAFFAELLI ITY REDUNDANCY SCREENS NC A B C I [] [] [P] [P] I [N] [N] [N] (If different from NASA) I [] [] [] [NATIONALE: (If applicable) ATTIONALE: (If applicable)	EMU-249 112-FM1 EMU 249 PRIMARY O2 PRESSURE SENSOR (ITEM 11: G. RAFFAELLI ITY REDUNDANCY SCREENS POOR A B C [

ASSESSME	ESSMENT DATE: 12/10/86 ESSMENT ID: EMU-252 A FMEA #: 112-FM2								NASA DATA: BASELINE [] NEW [X]											
SUBSYSTE MDAC ID: ITEM:	м:			EMU 252 PRI		Ϋ́	02	PRE	ssi	JRE	E S	ENSC	or	(ITEM	112	2)				
LEAD ANA	LYS	ST	:	G.	RAF	FΑ	ΕI	LI												
ASSESSME	NT:	:																		
CRITICALITY REDUNDANCY SCREENS FLIGHT										CIL ITEM										
	I	HDV	/FUI	NC			A			В				С						
NASA IOA]	3 2	/2R /1R]		[P P]	[F P]		[[P] P]]	X X]	*	
COMPARE	[N	/N]		[]	[N]		[]		[]		
RECOMMEN	DA!	ric	ONS:	(Ίf	di	.ff	eren	t :	fro	om :	NAS	A)							
	[2	/2]		[]	Į]		[]	(Al	[DD,	/DI]	ETE))
* CIL RE	TE	NT:	ION 1	RATI	ONA	LE	:	(If	ap;	pli	ica			ADEQUA ADEQUA]		

REMARKS:

THE IOA DISAGREES WITH THE NASA FINDINGS BECAUSE THE FAILED FULL HIGH FAILURE MODE, WHEN DETECTED DURING THE EVA, WILL RESULT IN IMMEDIATE MISSION TERMINATION. ALTHOUGH THE DETECTION TECHNIQUE IS VIA A STATUS CHECK THE IOA CANNOT CONSIDER THAT CHECK A REDUNDANT FUNCTION TO THIS SENSOR. THE IOA AGREES WITH THE CAUSES IDENTIFIED BY THE NASA.

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/86 EMU-250 112-FM3		NASA DATA: BASELINE [] NEW [X]								
MDAC ID:	EMU 250 PRIMARY C	D2 PRESS	ISOR (ITEM 1	12)							
LEAD ANALYST:	G. RAFFAE	ELLI									
ASSESSMENT:											
CRITICA FLIG	LITY R	REDUNDAN	CY SCRE	ENS	CIL ITEM						
HDW/F	JNC A	С									
NASA [2 /2 IOA [2 /2] [] [P] [P]	[] [P]	[X] * [X]						
COMPARE [/] [N	,) [n j	[N]	[]						
RECOMMENDATIONS:	(If dif	ferent	from NA	SA)							
[/] [] [3	[]	[] ADD/DELETE)						
* CIL RETENTION	RATIONALE:	(If ap	plicabl	e) ADEQUATE INADEQUATE							
REMARKS: THE IOA AND THE	NASA ARE I	N AGREEI	MENT.								

ASSESSMEN NASA FMEA	ΙT	II		EM	/10/8 U-25: 2-FM	1	i				NASA DATA: BASELINE [] NEW [X]									
SUBSYSTEM MDAC ID: ITEM:	1:			EMI 25: PR										112)					
LEAD ANA	LYS	ST:	:	G.	RAF	FA	ΕI	LLI												
ASSESSME	T:	;																		
(FI	[CAL]	r				DUND	ANC	CY B	SCRE		c				L EM	[
	ŀ	101	/FUI	VC.			A			D			C							
NASA IOA	[3 2	/2R /1R]		[[P P]	[F F]	[P P]]	X X]	*	
COMPARE	[N	/N]		[]	[]	[]		[]		
RECOMMEN	ľAC	ric	ons:		(If	di	.ff	eren	t 1	fro	om NAS	SA)								
	[2	/1R]		[]	[]	[]	(AI	[DD/	/DE) LE	TE))
* CIL RE	ΓEÌ	VT:	ION I	RAT	IONA	LE	E:	(If a	app	91 :	icable			DEQUAT DEQUAT]		
REMARKS:																				

THE IOA AGREES WITH THE NASA SCREENS; HOWEVER, THE IOA RECOMMENDS A 2/1R CRITICALITY DUE TO A WORST CASE SCENARIO WHERE THE PRIMARY OXYGEN IS PREMATURELY DEPLETED AND THE SOP IS FAILED. THIS ALSO CONSIDERS THAT ALTHOUGH THE FAILURE IS READILY DETECTABLE IN THE AIRLOCK, IT IS NOT DETECTABLE DURING EVA.

ASSESSME ASSESSME NASA FME	'nТ	ID:	EMU	10/86 -253 -FM5		NASA DATA: BASELINE [] NEW [X]								
SUBSYSTE MDAC ID:			EMU 253 PRI)2 P]	RESSUR	E SI	ENSOR	(ITEM	11	2)			
LEAD ANA	LYS	ST:	G.	RAFFAE	LLI									
ASSESSME	NT:													
		TICAL FLIGH		F	EDUI	NDANCY	SCF	REENS			CI	L	4	
	H	IDW/FU	NC	A										
NASA IOA	[1 /1 1 /1]	[[F]	[[P]	[[F]		[X X]	*
COMPARE	[/)	[N]	[N]	[N]		[)	
RECOMMEN	DAT	ons:	(If dif	fere	ent fr	om N	IASA)						
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THE IOA	AND	THE	NASA	ARE I	N AG	REEME	NT.							

ASSESSME ASSESSME NASA FME	ENT	II		EM	/10/ U-25 2-FM	4	5									DAT LIN NE		-	x]	
SUBSYSTE MDAC ID:				EM 25 PR	4	ξ¥	02	PRI	ESS	SUR	Œ	SENS	SOF	₹ ((ITE	EM 1	12)			
LEAD ANA	\LYS	ST	•	G.	RAF	F	AEI	LLI													
ASSESSME	ENT	:																			
		F	ICAL: LIGH: W/FUI	Г			RI A	EDUNI	DAI	NCY E		CRE	ENS	s c					E	ſ	
NASA IOA]	2	/1R /1R]		[P P]		[F	`]		[P P]]	X X]	*
COMPARE	[/]		[]		[]		[)			[]	
RECOMMEN	'ADI	ΓΙ	ons:		(If	d :	ifi	ferei	nt	fr	on	n NAS	SA))							
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THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSME	ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-248 NASA FMEA #: 112-FM7 SUBSYSTEM: EMU]	NASA BAS	ELIN		[x]	
SUBSYSTE MDAC ID:				24		RΥ	0:	2 P	RES	ssu	JRI	E SI	ENS	OR	(IT	EM 1	112)			
LEAD ANA	LY	ST	:	G.	RAF	F	AE:	LLI													
ASSESSME	NT	:																			
	CR:		ICAI LIGI		?		RI	EDUI	NDA	MC	Y	SCI	REEI	15					IL PEN	A	
	1		/FU				A				В			(2		,			•	
NASA IOA]	2 2	/1F /1F	R]]	P P]		[P P]		[]	P]			[X X]	*
COMPARE	[/]		[]		[]		•]			[]	
RECOMMEN	DA:	ric	ONS:	;	(If	d:	ifi	fere	ent	: f	ro	om 1	NASA	A)							
	[/]		[].		[]	l	•]	(ADI	[D/	'DF] :LF	ETE
* CIL RE	TEI	TT)	ON	RAT	'IONA	LI	Ξ:	(Ii	f a	pp	1 i	.cal	·	1	ADEQI ADEQI			[]	
THE IOA	ANI	נ כ	THE	NAS	A AR	E	I	I AC	GRE	EM	EN	IT.									

ASSESSMEN ASSESSMEN NASA FMEA	T I		12/10 EMU-2 113A-	227				NASA BASE	LINE			
SUBSYSTEM MDAC ID: ITEM:	:		EMU 227 CHEC	K VAL	VE A	ND FILT	PER (I	TEM 1	L3A)			
LEAD ANAI	LYST	:	G. R	AFFAE:	LLI							
ASSESSMEN	T:											
C		ICAL LIGH	ITY	R	EDUN	DANCY S	CREEN	S		CIL		
	_		NC	A		В		С				
NASA IOA	[2	/2 /2]	[[P]]	[[P] [P]		[X] ;	k
COMPARE	[/]	[N]	[N]] [N]		[)	
RECOMMENI	DATI	ons:	(I	f dif	fere	ent from	n NASA	.)				
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REMARKS:	AND	THE	NASA	ARE I	n Ac	REEMEN	г.					

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SUBSYSTI MDAC ID: ITEM:			EMU 228 CHECK	VA:	LVE	AND FI	LTER	(ITE	EM 113A	7)				
LEAD AND	ALYS	r:	G. RA	FFA	ELLI									
ASSESSMI	ENT:													
	1	FICAL: FLIGHT DW/FUI	r	1		NDANCY B		EENS C	· !		CI			
NASA IOA		3 /1R 3 /1R]	[]	P]	[F [F]	[P]		[X X]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	IDAT]	cons:	(If	dif	fer	ent fr	om N	ASA)						
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* CIL REREMARKS: THE IOA								A	DEQUAT:		[]	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-222 113A-FM3			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 222 CHECK VA	ALVE AND) FILTER (ITEM 113A)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL		REDUNDA	NCY SCREE	NS	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [2 /2 IOA [2 /1R] [] P]	[] [F]	[] [P]	[X] * [X]
COMPARE [/N		и]	[N]	[N]	[]
RECOMMENDATIONS:	(If d	ifferen	t from NAS	A)	
[2 /1R	.] [P]	[P]	[P]	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If	applicable	e) ADEQUATE INADEQUATE	
REMARKS: THE IOA DISAGREE 2/1R CRITICALITY	' TO REFL	ECT SCE	NARIO OF 1	THE IOA R	NCORRENT

CHECK VALVE AND SOP FAILURES. SCREENS SHOULD ALL BE PASSED.

ASSESSMI ASSESSMI NASA FMI	ENT	'I	D:	\mathbf{E}_{i}	2/10 MU-2 13A-	23										A DA SELI N		[x]	
SUBSYSTIMDAC ID:				2	MU 23 HECK	V.	ΆL	VE	ANI) I	FI:	LTE	R (I	TE:	M 1	.13A)				
LEAD ANA	YLY	ST	:	G	RA:	FF.	ΑE	LLI	[
ASSESSME	ENT	:																			
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COMPARE	[/]		[]		[]	[]			[]	
RECOMMEN	'DA'	CIC	ONS:	:	(If	di	if	fer	ent	f	rc	m 1	NASA)							
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* CIL RE	TEN	ITI	ON	RAT	IONA	LE	E :	(I	f a	pp	li	cak				UATE UATE		•]	
REMARKS: THE IOA	ANE) I	HE	NAS	A AR	Œ	IN	I A	GRE	EM:	EN	т.					·	•		•	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-230 113B-FM1			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 230 ADJUSTAB	LE ORIF	ICE (ITE	1 113B)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAL		REDUNDA	NCY SCRE	ens	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [2 /1R IOA [2 /1R] [P] P]	[P] [P]	[P] [P]	[X] * [X]
COMPARE [/] [3	[]	[]	[]
RECOMMENDATIONS:	(If di	fferent	from NA	SA)	
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* CIL RETENTION	RATIONALE	E: (If a	npplicabl	e) ADEQUATE INADEQUATE	
REMARKS: THE IOA AND THE	NASA ARE	IN AGRE	EEMENT.		

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LEAD AN	ALY	ST	:	G	. RA	FF	AΕ	LLI	•											
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		F	LIG	HT			R	EDU	NDA	NC	Y	SCI	REEN	s				IL TE		
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/8 EMU-229 113B-FN	€				1	NASA DATA BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	EMU 229 ADJUST	ABLE	ORIF	ICE	(ITEM	1	13B)		
LEAD ANALYST:	G. RAF	FAEL	LI						
ASSESSMENT:									
CRITICAI FLIG		RE	DUNDA	NCY	SCREE	NS		CIL	
HDW/FU		A		В			С		
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COMPARE [/]	[]	[]	[]	[]
RECOMMENDATIONS	: (If	diff	ferent	fr	om NAS	SA)			
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* CIL RETENTION	RATIONA	LE:	(If a	appl	icable		ADEQUATE IADEQUATE]
REMARKS: THE IOA AND THE	NASA AF	RE II	N AGR	EEME	NT.				

ASSESSM ASSESSM NASA FM	ENT	ľ	D:	EM	2/10/8 MU-234 L3C-FN	1							N		A DAT SELIN NE			[[]	
SUBSYST MDAC ID ITEM:				EM 23 ON		VA	LV)	E (I	ТE	EΜ	11	.3C)							
LEAD AND	ALY	ST	:	G.	RAFF	ΆE	LL	Γ											
ASSESSMI	ENT	:																	
		F	LIG	LITY HT UNC				JNDA			sc	REEN					IL TE		
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NASA IOA]	2	/2 /2]] [P]		[[P]	[P]		[X X]	*
COMPARE	[/]	[N]		[:	N]	[N]		[]	
RECOMMEN	[ACI	ľIC	ONS:	:	(If d	if	fer	ent	f	ro	m l	NASA)						
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REMARKS:															UATE UATE]]	
THE IOA	AND	T	HE	NASA	A ARE	IN	A	GREE	MI	EN'	Г.								

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-233 113C-FM2			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 233 ON/OFF VA	LVE (ITE	M 113C)		
LEAD ANALYST:	G. RAFFAE	LLI			
ASSESSMENT:					
CRITICAL		EDUNDANC	Y SCREE	NS	CIL ITEM
FLIGH HDW/FU			В	С	
NASA [2 /1R IOA [2 /2] [P) [P] P]	[P] [P]	[X] * [X]
COMPARE [/N] [] [1	[]	[]
RECOMMENDATIONS:	(If dif	ferent f	rom NAS	A)	
[2 /2] [] []	[] (A)	[] DD/DELETE)
* CIL RETENTION	RATIONALE:	: (If app	olicable	ADEQUATE	
REMARKS: THE IOA AND THE	NASA ARE	IN AGREEN	MENT ON	SCREEN ASSI	GNMENTS AND

HARDWARE CRITICALITY; HOWEVER, THE FUNCTIONAL CRITICALITY IS RECOMMENDED TO BE A "2". THE IOA MAKES THIS SUGGESTION DUE TO THE VALVE BEING MECHANICALLY POSITIONED "OPEN" PRE-EVA AND THEREFORE NOT CAPABLE OF THIS FAILURE WITHOUT OPERATOR ERROR (WHICH IS ADVERSE TO GROUNDRULES) DURING THE EVA.

ASSESSM ASSESSM NASA FM	ENT	' I	D:	El	2/10/ MU-23 13C-F	2								IASA BASE		E [x]	
SUBSYST: MDAC ID ITEM:				2:	MU 32 N/OFF	' V	Ά	LVE	E (I	TEM	f 11	L3C)							
LEAD AND	ALY	ST	:	G.	RAF	FA	E	LLI											
ASSESSMI	ENT	:																	
		F	LIG		ľ				'NDA			REEN					I L TEI		
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NASA IOA	[2	/11	R]		[P P]		[P [P]	[P P]		[X X]	*
COMPARE	[/]		[]]	[]		[]	
RECOMMEN	IDA!	ric	ons:	:	(If o	di	£1	fer	ent	fr	om :	NASA))						
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REMARKS: THE IOA	ANI	r	HE	NAS.	A ARE	E 1	ΞN	I AC	GREE	MEI	NT.	IN	IAE	EQUA	TE	[]	

ASSESSMENT ASSESSMENT NASA FMEA	ID:	12/10/ EMU-23 113D-F	6					ASA DATA BASELINE NEW		_
SUBSYSTEM: MDAC ID: ITEM:		EMU 236 PRIMAR	Y RI	EGULAT	OR ((ITEM	113	D)		
LEAD ANALY	ST:	G. RAF	'FAE	LLI						
ASSESSMENT	1 •									
CR	RITICAL		R	EDUNDA	ANCY	SCREE	ns		CIL	
	FLIGH HDW/FU		A		В		С			-
NASA [IOA [2 /1R 2 /1R]	[P]	[P]	[P]	[X [X] *]
COMPARE [. /	1	[]	[]	[]	[]
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* CIL RETI	ENTION	RATION	ALE:	(If	appl	icable	A	DEQUATE	_]
REMARKS: THE IOA A	ND THE	NASA A	RE I	N AGR	EEME	NT.				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-237		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 237 PRIMARY REG	ULATOR (ITEM	113D)	
LEAD ANALYST:	G. RAFFAELL	I		
ASSESSMENT:				
FLIGHT	יי	UNDANCY SCREI		CIL ITEM
HDW/FUN	IC A	В	С	
NASA [2 /1R IOA [2 /1R] [P]	[P] [P]	[P] [P]	[X] * [X]
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If diffe	rent from NAS	GA)	
[/] []	[]		[] DD/DELETE)
* CIL RETENTION R	ATIONALE: (If applicable	e) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AND THE N	ASA ARE IN A	AGREEMENT.		- *

ASSESSMEN ASSESSMEN NASA FME	$\mathbf{T}^{\mathbf{r}}$	II	D:	EM	J-23	8									SASEI		[] X]		
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LEAD ANA	LYS	3 T :	:	G.	RAF	F	AEI	LI												
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C	CR]		ICAL:				RI	EDUI	NDAN	CY	s	CREE	NS	5			CI			
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NASA IOA	[3	/3 /1R]		[P]	[P]]	P]		[:	x]	*	
COMPARE	[N	/N]		[N]	[N]		[N]		[]	N]		
RECOMMEN	DA?	ric	ons:		(If	đ	if	fere	ent	fr	om	NAS	A))						
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REMARKS:																				MDED
THE IOA	ANI LUI	D ! RE	THE :	NAS E S	A AI UCH	RE T	II 'AH	N D. F I	ISAG. I DO	KE. ES	EM!	ENT.	EI	N . PRI	THAT ESENT	ACAN IHT 7	E W	as ORS	T C	ASE
SCENARIO		A	DDIT	ION	ALL	Ζ,	B'	S	UCH	BO	UNI	DS I	H.	IS	FAII	LURE	МО	DE	IS	VERY
SIMILAR THE IOA,	TO ייזי	1: भरा	13D- REFO	FM7 RE	REC	A)	RD. MM1	ING END!	OSC S A	IL. 2/	ĹA'. 1 R	L'ING CRT	; (T	JUT ICA	L'EUT' VLIT	Z. P	ASS	AGF	OF	ALL
SCREENS,	Al	ND	INC	LUS	ION	I	N :	THE	CIL	F	OR	THI	s	F	AILUI	RE MO	DDE	WH	ICH	

SHOULD ALSO NOT BE BOUNDED. THE FAILURE MODE SHOULD ALSO BE

BROKEN INTO TWO-DRIFT HIGH AND DRIFT LOW.

ASSESSME ASSESSME NASA FME	NT I	D:	EMU-2	39								ASA DATA BASELINE NEW			
SUBSYSTE MDAC ID:			EMU 239 PRIMAI	RY	RI	EGULA:	roı	R	(ITEI	и 1	131	D)			
LEAD ANA	LYST	:	G. RAI	FF	AE]	LLI									
ASSESSME	NT:														
			TTY.		RI	EDUND	/N(CY	SCRI	EEN	S		CIL		
		LIGHT N/FUN			A			В			С		ITE	M	
NASA IOA	[3 [2	/3 /1R]	[P]	[P]	[P]	[x]	*
COMPARE	[N	/N]	[N]	[N]	[N]	[N]	
RECOMMEN	DATI	ons:	(If	đ:	iff	ferent	: 1	fro	om NA	SA)				
	[2	/1R]	[P]	[P]	(P		[A DD/D		ETE)
* CIL RE	TENT	ON F	RATIONA	L	Ξ:	(If a	ıpp	oli	cabl	.e)					
										I	IA IAI	DEQUATE DEQUATE	[]	
REMARKS:	3.17D 0													-	
THE IOA THIS FAI	AND 1	MODE	IASA AF SUCH	Œ TF	Λ ΓΑΙ	I DISA	GF OE	ŒI S	EMENT NOT	REI	l I	HAT NASA SENT THE	A HAS	3 E Por	CASE
SCENARIO	. AI	DITI	ONALLY		BY	SUCH	E	OU	INDS	TH	[S	FAILURE	MODI	EI	S VERY
SIMILAR	TO 11	3D-F	M7 REG	AF	RDI	NG OS	CI	LI	ATIN	ig (ruc	PUT.			

THE IOA, THEREFORE, RECOMMENDS A 2/1R CRITICALITY, PASSAGE OF ALL SCREENS, AND INCLUSION IN THE CIL FOR THIS FAILURE MODE WHICH SHOULD ALSO NOT BE BOUNDED. THE FAILURE MODE SHOULD ALSO BE

BROKEN INTO TWO-DRIFT HIGH AND DRIFT LOW.

ASSESSM ASSESSM NASA FM	ENT	I	D:	: 12 EM 11	$\Pi - 2$	40		FM	6						ASA BASE		E]	
SUBSYST MDAC ID ITEM:	EM:			EM 24 PR	0	RY	R	EGU]	LAT	'OF	٤ ((ITE)	M 1	131	D)					
LEAD AN	ALYS	ST	:	G.	RAI	FF.	AE:	LLI												
ASSESSM	ENT:	:																		
		F]	LIGI	LITY HT JNC			RI A		۸DA			SCRI	EENS					IL TE		
											В			С						
NASA IOA	[2	/2 /2]		[P]		[NA]	[NA]		[X X]	*
COMPARE	[/]		[N]		[N]	[N]		(]	
RECOMMEN	IAGI	'IC	ons:		(If	di	iff	ere	nt	f	ro	m NA	ASA)							
	[/]		[]		[]	(]	(<i>1</i>		/D:		ETE)
* CIL RE REMARKS: THE IOA													-		EQUA EQUA		[]	

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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-712: 113D-FM					ì	NASA I BASEI		_]	
SUBSYSTEM: MDAC ID: ITEM:	EMU 712 PRIMARY	RE	GULAT(OR (ITEM	11:	3D)				
LEAD ANALYST:	G. RAFF	AEL	LI								
ASSESSMENT:											
CRITICAL		RE	DUNDA	NCY	SCREE	NS			CIL	M	
FLIGH HDW/FU		A		В			С				
NASA [3 /3 IOA [3 /3] [P]	[[P]	[P]		[] *]	
COMPARE [/] [N	1	[N]	[N]		[]	
RECOMMENDATIONS	: (If d	liff	erent	fro	om NAS	SA)					
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* CIL RETENTION	RATIONA	LE:	(If a	appl:	icable		ADEQU NADEQU		[]	
REMARKS: THE IOA AND THE	NASA AR	E II	N AGRI	EEME	NT.						

ASSESSMI ASSESSMI NASA FMI					DATI ELINI NEV	Ξ [x]						
SUBSYSTIMDAC ID:			EM 24 H2		ATO:	R (ITI	EM 1:	13E)						
LEAD ANA	ALYS'	r:	G.	RAFFAE	LLI									
ASSESSME	ENT:													
	1	FLIGH	\mathbf{T}	R	EDUI	NDANCY	SCF	REENS				IL FEM		
	HI	OW/FU	NC	A		E	3	C	2			LISTI		
NASA IOA	[2	2 /1R 2 /1R]	[P]	[P]	[I)])]		[X X]]	*
COMPARE	[/	3	[]	[]	ſ]		[]	
RECOMMEN	DATI	ons:	(If dif	fere	nt fr	om N	ASA)						
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* CIL RE	TENT	ION 1	RATI	ONALE:	(If	appl	icab	A	DEQU.	ATE ATE	[]		
THE TOA	AND	א שאיי	1262	7 DE T1	1 30									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-243 113E-FM2			NASA DATA BASELINE NEW	
	EMU 243 H20 REGU	ULATOR	(ITEM 113)	Ε)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL		REDUNI	ANCY SCRE	ens	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [3 /3 IOA [2 /1R] [] P]	[] [P]	[] [P]	[x] *
COMPARE [N /N] [N]	[N]	[N]	[N]
RECOMMENDATIONS:	(If d	ifferen	nt from NA	SA)	
[2 /1R	:] [P]	[P]		[A] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If	applicabl	e) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AND THE	NASA ARE	IN DI	SAGREEMENT	. THE IOA B	ELIEVES THE

PRESSURE LIMITATIONS WITHIN THE NASA FAILURE MODE DO NOT REPRESENT THE WORST CASE SCENARIO. ADDITIONALLY, THE NASA FAILURE MODE IS VERY SIMILAR TO 113E-FM6 FOR OSCILLATING OUTPUT. AS SUCH THE IOA RECOMMENDS A 2/1R CRITICALITY FOR A "REGULATES HIGH" FAILURE MODE, PASSAGE OF ALL SCREENS, AND INCLUSION IN THE CIL.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-245 113E-FM3	1	NASA DATA: BASELINE NEW	-]
	EMU 245 H20 REGULATOR	(ITEM 113E)			
LEAD ANALYST:	G. RAFFAELLI				
ASSESSMENT:					
CRITICALI FLIGHT HDW/FUN	[ANCY SCREENS B C	<u>!</u>	CIL ITEN	1
NASA [2 /1R IOA [2 /1R] [P]] [P]	[P] [P [P]	[X]] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If different	from NASA)			
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* CIL RETENTION R REMARKS: THE IOA AND THE N		A INA	DEQUATE DEQUATE	[]

ASSESSMENT DATASSESSMENT ID:	EMU-24									
SUBSYSTEM: MDAC ID: ITEM:	EMU 244 H2O REGULATOR (ITEM 113E)									
LEAD ANALYST:	G. RAF	FAELLI								
ASSESSMENT:										
	CALITY IGHT	REDUND	ANCY SCRE	ENS	CIL ITEM					
	FUNC	A	В	С	•					
NASA [2]	/2] /1R]	[] [P]	[] [P]	[] [P]	[X] * [X]					
COMPARE [/N]	[N]	[N]	[N]	[]					
RECOMMENDATIO	NS: (If	differen	t from NA	SA)						
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* CIL RETENTI	ON RATION?	ALE: (If	applicabl	e) ADEQUATE INADEQUATE						
REMARKS:		OF THE ACT	PENEMENT ON	HADDWARE CR						

THE IOA AND THE NASA ARE IN AGREEMENT ON HARDWARE CRITICALITY. HOWEVER, THE IOA RECOMMENDS A "1R" FUNCTIONAL CRITICALITY DUE TO POSSIBLE CREWPERSON LOSS IF SOP ALSO FAILS DURING AN EFFORT TO PROVIDE COOLING AND DEFOG CAPABILITY. ALL SCREENS SHOULD BE PASSED. ADDITIONALLY, THE NASA FAILURE MODE BOUNDS THE FAILURE BY PRESSURE RANGE SUCH THAT THE WORST CASE SCENARIO IS NOT FULLY PRESENTED.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-241		NASA DATA BASELINE NEW	-
SUBSYSTEM: MDAC ID: ITEM:	EMU 241 H2O REGULATOR	(ITEM 113E)	
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICALI FLIGHT HDW/FUN		ANCY SCREET	ns C	CIL ITEM
NASA [2 /1R IOA [2 /1R] [P]] [P]	[P] [P]	[P] [P]	[X] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If differen	t from NASA	7)	
[/] []	[] [[] DD/DELETE)
* CIL RETENTION R REMARKS: THE IOA AND THE N		ı	ADEQUATE NADEQUATE	[]

ASSESSMEN ASSESSMEN NASA FME	NT I	D:	8/06/8 EMU-71 113E-F	.3X				N	IASA D BASEL	INE	[]
SUBSYSTEM MDAC ID:	M:		EMU 713 H20 RE	GULA	TOR	(ITEN	4 113E	:)				
LEAD ANA	LYSI	r:	G. RAF	FAEL	LI							
ASSESSME	NT:											
		rical:		RE	DUND	ANCY	SCREE	ns			CIL	М
	-	OW/FUI		A		В		C				
NASA IOA	[3	3 /3]	[]	[]	[]		[] *
COMPARE	[/]	[]	[]	[]		[]
RECOMMEN	DAT:	ions:	(If	diff	eren	t fr	om NAS	SA)				
·	[/]	[]	[]	[]	(AI	[DD/D] ELETE)
* CIL RE	TEN	rion :	RATION	ALE:	(If	appl	icable	7	ADEQU <i>A</i> ADEQU <i>A</i>		[]
REMARKS:												

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-209 114-FM1,	FM2			NASA DATA BASELINI NEV		
MDAC ID:	EMU			R (ITE	M 114)		
LEAD ANALYST:	G. RAFFAI	ELLI					
ASSESSMENT:							
FLIGHT				SCREEN	S	CIL	
HDW/FU	NC A	Ą	В		С		
NASA [3 /1R IOA [3 /2R] []	?] ?]	[P]] [P] P]	[] *]
COMPARE [/N] [3	[]] []	[]
RECOMMENDATIONS:	(If dif	ferent	from	n NASA)			
[3 /2R] []	[]] [] (A	[.DD/D] ELETE)
* CIL RETENTION F	ATIONALE:	(If a	pplic	cable)			
REMARKS:		•		=	ADEQUATE ADEQUATE	[]
THE IOA AND THE N SCREEN ASSIGNMENT FUNCTIONAL CRITIC TO THIS SENSOR.	'S. HOWEV	ER, THI	E IOA	RECOM	MENDS A "	2P#	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-210 114-FM3, F	FM4	NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 210 PRESSURE S	SUIT SENSOR (IT	EM 114)	
LEAD ANALYST:	G. RAFFAEI	LLI		
ASSESSMENT:				
FLIGH	T	EDUNDANCY SCREE	ns C	CIL ITEM
HDW/FU	NC A	В	C	
NASA [2 /2 IOA [3 /2R] [] [P] []]]	[] [P]	[X] * []
COMPARE [N /N] [N] [N]	[N]	[N]
RECOMMENDATIONS:	(If dif	ferent from NAS	A)	
[/] [] []	[] (AI	[] OD/DELETE)
* CIL RETENTION	RATIONALE:	(If applicable	e) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AGREES W HOWEVER, THE NAS OPERATIONS REGAR	A ALSO PLA	CED A 3/1R CRIT	CICALITY ON I	EVA

DUE TO THE SOP NOT BEING CONSIDERED REDUNDANT TO THIS SENSOR.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-212 114-FM5			NASA DAT. BASELIN NE	
SUBSYSTEM: MDAC ID: ITEM:	EMU 212 PRESSURE	SUIT SEN	NSOR (I	TEM 114)	
LEAD ANALYST:	G. RAFFAE	LLI			
ASSESSMENT:					
CRITICAL: FLIGHT HDW/FUN	ŗ	EDUNDANC	EY SCRE	EENS C	CIL ITEM
NASA [2 /1R IOA [2 /1R] [P		F] F]	[P] [P]	[X] * [X]
COMPARE [/] [] [)	[]	[]
RECOMMENDATIONS:	(If dif	ferent f	rom NA	SA)	
[/] [] []	[]	[] ADD/DELETE)
* CIL RETENTION FREMARKS: THE IOA AND THE N				e) ADEQUATE INADEQUATE	• •

ASSESSMEN ASSESSMEN NASA FMEA	T	ID		EMU	10/3 -21 -FM	1								1			DATA LINI NEV	E [K :]]	
SUBSYSTEM MDAC ID: ITEM:	:			EMU 211 PRE		RE	s	UI!	rs	SEN	ıso	R	(ITI	ΞM	1	14)						
LEAD ANAL	χS	т:		G.	RAF	FA	EL	LI														
ASSESSMEN	T:																					
c	RI						RE	DU	ND	ANO	CY	sc	REE	NS					CI IT	L EM		
	CRITICALITY RE FLIGHT HDW/FUNC A										В				С			·				
NASA IOA	[2 2	/1R /1R]		[P P]		[P P]] [P P]			[X]	*
COMPARE	[/]		[3		[]		[]			[]	
RECOMMEN	DA:	rI(ons:		(If	d:	if:	fer	en	t	fr	om	NAS	A))							
	[/	1		[}		[]		[]	1	(AD	[D/	/DI] ELE	TE)
* CIL RE	TE	NT:	ION	RAT	ION	ΑL	E:	(]	Ιf	ap	pl	ic	able				UATI UATI		[]	
REMARKS: THE IOA	ИA	D	THE	NAS	A A	RE	I	N Z	AGF	REF	ME	NT	•									

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SUBSYST MDAC ID ITEM:	EM:			EM 75 PR	2	UR	E	SUIT	SE	ns	OR									
LEAD AN	ALY	ST	':	G.	RAI	FF.	AE:	LLI												
ASSESSMI	ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIT.																			
	CR						R	EDUNI	OAN	CY	s	CREE	NS				L			
	FLIGHT HDW/FUNC A												С			ΙΊ	EM	ſ		
NASA IOA	[3	/1R /2R]											[X X] ;	k		
COMPARE	[/N]		[]	(N]		[J		(]		
RECOMMEN	DAI	CIC	ons:		(If	di	ff	eren	t i	fro	m	NAS.	A)							
	[3	/2R]]]	[]		[]	(AI	[DD/:] LET	E)	
* CIL RE	TEN	TI	ON F	(TAS	ONA	LE	:	(If	app	li	ca	ble								
REMARKS:													IANI	EQUA'	ΓE		•]		
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ASSESSMEI ASSESSMEI NASA FMEI	T I	D:	12/10 EMU-2 115-F	59					ASA DATA BASELINE NEW			
SUBSYSTEMDAC ID:	M:		EMU 259 SHEAR	PLA	TE A	.SSEMB	LY ((ITEM :	115)			
LEAD ANA	LYST	:	G. RA	FFAE	LLI							
ASSESSME	NT:											
•	F	ICAL LIGH W/FU		F		idancy B		REENS C		CIL		
NASA IOA	[2	/2 /2]	[[I)	[[P]	[N] A]	[X [X]	*
COMPARE	[/]	[]	1]	[N)	ĺИ]	[]	
RECOMMEN	DATI	ons:	(If	dif	ffere	ent fr	om 1	NASA)				
	[/]	[]	[]	[] (2	[ADD/D		TE)
* CIL RE	TENT	ION	RATION	ALE	: (If	appl	ical	ble) A INA	DEQUATE DEQUATE	[]	
REMARKS: THE IOA	AND	THE	NASA A	RE I	IN AC	REEME	NT.					

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	E: 12/10/86 EMU-268 115-FM10					ASA DATA BASELINI NEV]	
SUBSYSTEM: MDAC ID: ITEM:	EMU 268 SHEAR PL	ATE A	SS EM B:	LY					
LEAD ANALYST:	G. RAFFA	ELLI							
ASSESSMENT:									
CRITICA FLIC		REDUN	DANCY	SCRE	ENS		CII		
HDW/I	TUNC 1	A	В		С				
NASA [2 /2 IOA [2 /2] [:	P]	[[P]	[[F]	[X [X	:] [;]	*
COMPARE [/	1 [1]	[N]	[N]	[]	
RECOMMENDATIONS	: (If di	fere	nt fro	om NAS	SA)				
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* CIL RETENTION	RATIONALE:	(If	appli	.cable	AD	EQUATE EQUATE	•	j	
REMARKS: THE IOA AND THE	NASA ARE I	N AGF	REEMEN	m.	TIMD	FÄOVIE	[J	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-270 115-FM11		NASA DATA: BASELINE [] NEW [X]	
SUBSYSTEM: MDAC ID: ITEM:	EMU 270 SHEAR PLAT	E ASSEMBLY (ITEM	115)	
LEAD ANALYST:	G. RAFFAEL	LI		
ASSESSMENT:				
CRITICAL		EDUNDANCY SCREENS	CIL ITEM	
FLIGH HDW/FU		В	С	
NASA [3 /1R IOA [2 /1R] [P]] [NA] [] [P] [P] [] ;	*
COMPARE [N /] [] [N] [N] [N]	
RECOMMENDATIONS:	(If dif	ferent from NASA)		
[/] [] [] [] [] (ADD/DELE	TE)
* CIL RETENTION	RATIONALE:		ADEQUATE []	
REMARKS: THE IOA CONCURS	WITH THE N	ASA FINDINGS AND	ASSIGNMENTS.	

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SUBSYSTE MDAC ID:				EN 26 SI	59	P	LA	TE	ASS	E:	MB:	LY	(ITE	M	115	5)					
LEAD ANA	LY	ST	:	G.	RA	FF.	ΑE	LL	I												
ASSESSME	NT	:																			
		F	ICAI LIGH	T	?		R	EDI	UNDA	N	CY	S	CREEN	S					IL PEN	VI	
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NASA IOA]	3	/1R /3]]	P P]		[F P]	[P P]			[X]	*
COMPARE	[/N]		[]		[N]	[]			[N]	
RECOMMEN	DAT	CIC	ons:		(If	đ	Ĺfí	fer	cent	1	rc	m	NASA))							
	[/]		[]		[]	[]		(AI	[\QC	'DE] :LF	TE)
* CIL RE	TEN	TI	ON :	RAT	IONA	LE	E:	(I	f a	pp	li	.ca	•			UATI UATI		[]	
REMARKS: THE IOA	AGF	REE	s W	IТН	THE	N	IAS	Α	FIN	DI	NG	s.			-			L		J	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:			NASA DATA: BASELINE [] NEW [X]									
MDAC ID:	EMU 257 SHEAR PI	LATE ASSEMBLY (ITEM	115)									
LEAD ANALYST:	G. RAFF	AELLI										
ASSESSMENT:												
CRITICAL	CIL ITEM											
FLIGHT HDW/FUI		A B	C									
NASA [2 /2 IOA [3 /1R] [P] [F] [[X] * P] [X]									
COMPARE [N /N] [и] [и] [З	N] []									
RECOMMENDATIONS:	(If d	ifferent from NASA)										
[3 /1R] [P] [F] [P] [] (ADD/DELETE)									
* CIL RETENTION	RATIONALI	E: (If applicable)	ADEQUATE [] ADEQUATE []									
RECOMMENDS A 3/1 CONCURRENT FAILU	R TO REFI RES OF 1:	HE NASA CRITICALITY LECT POSSIBLE CREWP 13A AND OXYGEN SYST WITH NASA FAILURE	ASSIGNMENT. THE IONERSON LOSS FOR EM COMPONENTS. THIS									

ASSESSME	ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-258 NASA FMEA #: 115-FM14 SUBSYSTEM: EMU														ASA BAS	ELI		[x]	
SUBSYSTE MDAC ID:				25		P	LA'	ΓE	ASS	SEMI	BL.	Y (ITE	M	115)					
LEAD ANA	LYS	ST	:	G.	RA	FF.	AE:	LLI													
ASSESSME	NT:	:																			
		F	ICAL LIGH	T	Ž.		RI A	EDU	NDA	NC		SCR:	EEN	s c					L LEN		
			•											_							
NASA IOA	[2	/1R /1R]		[P P]		[])]	[P P]			[X X]	*
COMPARE	[/]		[]		[]	[]			[]	
RECOMMEN	DAT	CIC	ons:		(If	d:	ifi	fer	ent	fr	or	n Ni	ASA)							
	[/]		[]		[•		[]	:	(AE	[D/	'DF] ELE	ETE)
* CIL RE	TEN	TI	ON 1	RAT	'ION <i>I</i>	LI	Ξ:	(I	f a	ppl	ic	ab]	•		DEQU DEQU			[]	
REMARKS: THE IOA	ANT	ν (HE 1	ZAV	A AT	P.	ΤN	JΔ	GRF	EME	יאי:	٦						-		-	
		-				~—				نلديد	12.2	. •									

ASSESSMEN ASSESSMEN NASA FME	NT ID):	12/10, EMU-2: 115-F	58A				_	ASA DA BASELI N	NE			
SUBSYSTEM MDAC ID: ITEM:	1:		EMU 258 SHEAR	PLA	TE A	SSEMB	LY (I	rem :	115)				
LEAD ANA	LYST:		G. RA	FFAE	LLI								
ASSESSME	NT:												
(JIGH	r			DANCY _	SCRE				CII		
	HDW	I/FUI	NC	A		В		С					
NASA IOA	[2 [2	/1R /1R]	[P]	[P [P]	[P]		[]	[] []	*
COMPARE	[/]	[]	[]	[]		[)	
RECOMMEN	DATIC	ons:	(If	dif	fere	nt fr	om NA	SA)					
	[/]	[]	[]	[]	(Al	[DD/I) EL	ETE)
* CIL RE	TENT	ION 1	RATION	ALE:	(If	appl	icabl	Α	DEQUAT DEQUAT		[]	
REMARKS:													

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-255			NASA DAT BASELIN NE	
MDAC ID:	EMU 255 SHEAR PI	LATE ASSEN	MBLY (IT)	EM 115)	
LEAD ANALYST:	G. RAFFA	AELLI			
ASSESSMENT:					
CRITICAL FLIGH	r	REDUNDANO			CIL ITEM
HDW/FU	NC	A	В	С	
NASA [2 /1R IOA [2 /1R] [P] [P] [P] [P] P]	[X] * [X]
COMPARE [/] [] [и] (]	[]
RECOMMENDATIONS:	(If di	fferent f	rom NASA	1)	
[/] [] [] [. 1	[] ADD/DELETE)
* CIL RETENTION I	RATIONALE	: (If app	olicable)		
REMARKS:				ADEQUATE NADEQUATE	[]
THE IOA AND THE NASA SCREEN B ASS	NASA ARE	IN AGREEM	ENT. TH	E IOA AGRE	EES WITH THE

ASSESSMEN ASSESSMEN NASA FME	TV	ID	TE:	EMU	6/87 -714X -FM17				N	IASA D BASEL		_]
SUBSYSTEM MDAC ID:	M:			EMU 714 SHE	AR PLAT	E A	SSEMBI	LY (ITEM	115)			
LEAD ANA	LYS	T:		G.	RAFFAEI	LI							
ASSESSME	NT:												
1	CRI		CAL	YTI	RE	EDUN	DANCY	SCR	EENS			CIL	M.
	ŀ		i/FU		A		В		(2			
NASA IOA	[2 2	/2 /2]	[]	[]	[]		[X] *
COMPARE	[/]	[]	ſ]	[]		[]
RECOMMEN	DA!	rio	ons:	. (If dif	fere	ent fr	om N	ASA)				
	[/]	Ţ]	[]	(]	(A)	[DD/D] ELETE)
* CIL RE	TE	NT:	ION	RATI	ONALE:	(I:	f appl	icab	,	ADEQU. ADEQU.		[]
REMARKS: THE IOA	AN	D '	THE	NASA	A ARE I	N A	GREEME	NT.					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-256				ASA DATA BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	EMU 256 SHEAR PL	ATE ASSI	EMBLY (I	TEM	115)		
LEAD ANALYST:	G. RAFFAI	ELLI					
ASSESSMENT:							
CRITICALI FLIGHT	י	REDUNDAN	NCY SCRE	ENS		CIL	
HDW/FUN	IC 2	A	В	С			
NASA [2 /1R IOA [3 /2R] []	?] [?	F]	[P]	[X] *
COMPARE [N /N] [) []	[]	[]
RECOMMENDATIONS:	(If dif	ferent	from NA	SA)			
[/] [] []	[[DD/D:] ELETE)
* CIL RETENTION R	ATIONALE:	(If ap	plicable	e)			
REMARKS:					EQUATE EQUATE	[]
THE IOA AGREES WI FULL AGREEMENT WI	TH THE NA TH THE SC	SA CRIT REEN AS	ICALITY (%a352 [S.	8HASSIGI	MEN	rs in

ASSESSMEN ASSESSMEN NASA FMEA	IT ID	:	EMU-	5/87 -715X -FM19				N	IASA DA BASEL	INE	[[]		
SUBSYSTEM MDAC ID: ITEM:	1:		EMU 715 SHE	AR PLAT	E AS	SEMBI	'Υ (ITEM	115)					
LEAD ANAI	YST:		G. I	RAFFAEL	LI									
ASSESSMEN	1T:													
(CRITI			RE	DUND	ANCY	SCR	EENS			CIL	M		
		IGH' V/FU		A		В		•	C					
NASA IOA	[3	/1R /2R]	[P [P]	[F [F]	[]	P] P]		[X]	*	
COMPARE	[/N	3	[]	(]	[]		[]		
RECOMMEN	DATI	SNC:	(If diff	erer	nt fr	om 1	NASA)						
	[/	1.	ſ]	[]	Į.]	(A)	[DD/D		TE)	
* CIL RE	TENT:	ION	RATI	ONALE:	(If	appl	ical		ADEQU <i>I</i> ADEQU <i>I</i>]		
REMARKS: THE IOA					SA CI	RITIC	ALI'	ry An	D IS	N F	ULL	AGF	REEMENT	C

ASSESSM ASSESSM NASA FM	ENT	'I	D:	EΜ	/10/8 J-260 5-FM2)						ASA DA BASELI N] []		
SUBSYST MDAC ID ITEM:				EMU 260 SHI)	`LA	TE	ASSE	EME	BLY	(ITE	M :	115)				
LEAD AND	ALY	ST	:	G.	RAFF	'AE	LL	Ι									
ASSESSMI	ENT	:															
		F	LIG			R	EDU	JNDAN	CY	sc:	REEN	s			CIL		
]	HDI	W/F	UNC		A			В	}		С		4	. 11	FI	
NASA IOA	[2	/2 /2]]	P]]	P]	[N.A]	[X]	*
COMPARE	[/)	[N]	ſ	N]	[N]	[]	
RECOMMEN	DA'	ric	ons:	: (If d	if	fer	ent	fr	om 1	NASA))					
	[/]	[]	[]	[] ([ADD	/DI] ELF	ete;
* CIL RE	TEN	ΙΤΙ	ОИ	RATIO	ONALI	Ξ:	(I	f ap	pl:	icab	ole)		_				
REMARKS:											IN		EQUATE EQUATE]	
THE IOA	AND	r	'HE	NASA	ARE	IN	I A	GREEN	1El	VT.							

NASASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-753X 115-FM20	DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 753 SHEAR PLATE ASSEMB	LY	
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICAL FLIGH HDW/FU	T		CIL ITEM
NASA [2 /1R IOA [2 /1R		P] [P]	[X] * [X]
COMPARE [/] [] [] []	[]
RECOMMENDATIONS:	(If different fr	om NASA)	
[/] [] [] [] (A	[] .DD/DELETE)
* CIL RETENTION REMARKS:	RATIONALE: (If appl	licable) ADEQUATE INADEQUATE	[]
	NASA ARE IN AGREEME	ent.	

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	EMU-754 115-FM2	X 21		NASA DATA BASELINI NEV	
SUBSYSTEM: MDAC ID: ITEM:	754	PLATE ASS	SEMBLY		
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
	LITY IT	REDUNDA	NCY SCRE	ENS	CIL
	JNC	A	В	С	ITEM
NASA [2 /1] IOA [3 /1]	R] [P] P]	[F] [F]	[P] [F]	[X] * [X]
COMPARE [N /] []	[]	[N]	[]
RECOMMENDATIONS	(If d	ifferent	from NA	SA)	
[3 /11	?] []	[F]	[] (A)	[] .DD/DELETE)
* CIL RETENTION REMARKS:	RATIONAL	E: (If a	pplicable	e) ADEQUATE INADEQUATE	[]
THERE ARE TEN (1 MAINTAIN INTEGRI INTEGRITY. SINC LIFE THE HARDWAR	TY. THE	REFORE, E SECOND	4 SCREWS FAILURE	MUST BE LOS CAN RESULT	T TO LOSE IN LOSS OF
THE SCREWS ARE LIKE FAILURES AND SCR	HARDWARE	THEY AR	E SUSCEPT	FIBLE TO COM	MON CAUSE

ASSESSMEN ASSESSMEN NASA FME	I TV	D:	12/1 EMU- 115-	-261	6							ASELII N	NE	[x]	
SUBSYSTEM MDAC ID:	4:		EMU 261 SHE	AR P	LAT	E A	SSEM	ΙΒΙ	.Y (ITEM	1	15)				
LEAD ANA	LYST	Γ:	G. 1	RAFF	AEI	LLI										
ASSESSME	NT:															
		rical			RI	EDUN	DANC	CY	SCR	EENS	5			CIL		
		FLIGH DW/FU			A			В			С					
NASA IOA		2 /2 2 /2]	[P]	[P]	[F]		[X]	*
COMPARE	[/	3	1	N]	[N]	[N]		[]	
RECOMMEN	DAT	ions:	(If o	lif	fere	ent :	fr	om N	IASA))					
	[/]		[]	[]	[]	(A	[DD/D	ELF	ETE)
* CIL RE	TEN	TION	RATI	ONA:	LE:	(I:	f ap	pl	icak			DEQUAT		[]	
REMARKS: THE IOA	AND	THE	NASA	AR	E I	n A	GREE	ME	NT.							

ASSESSM ASSESSM NASA FM	ENT	ID:	: 1	12/10 EMU-2 115-F	62	:							ì		A DA SELI		[]	
SUBSYST MDAC ID ITEM:			2	EMU 262 SHEAR	P	LA	TE	ASS	El	MB:	ĽΥ	(ITI	EM	115	5)					
LEAD AN	ALYS	T:	C	. RA	FF	ΑE	LLI													
ASSESSM	ENT:																			
		FLI	ALIT GHT FUNC	Y:		R:		NDA	NC	ey B	s	CREEN	s C	ı			CI II	L EM		
NASA IOA	[2 / 2 /	2] 2]		[þ]		[P]	[F]]	X X]	*
COMPARE	[/]		[N]	1	(N]	[N]			[]	
RECOMMEN	DAT	ION	s:	(If	đ	if1	fere	ent	f	rc	m	NASA)							
	[/]		[]	(]	[]		(AD	[D/	DE] LE	TE
* CIL RE REMARKS: THE IOA															UATI UATI		[j] 	·
											- •									

ASSESSMI ASSESSMI NASA FMI	ENT	II):	EM	/10/86 U-265 5-FM5	5									DAT LIN NE]	
SUBSYSTI MDAC ID ITEM:				EMI 26		LAI	re .	ASS:	EM	BL	Y								
LEAD AN	ALY	ST	:	G.	RAFF	AEI	LLI												
ASSESSM	ENT	:																	
		F	CAL LIGH'	Г		RI A	EDU	NDA		Y B	SC	REENS	s C				IL TEI		
			•							_	_	_	-	_		-		-	
NASA IOA	[2 2	/1R /1R]	[P P]		[NA F	·]	[P]]	X]	*
COMPARE	[/]	[]		[N]	[]		[]	
RECOMME	NDA	TI	ons:		(If d	if	fer	ent	f	rc	m I	NASA))						
	[/]	[]		[]	[]	(] ADD	/D:] ELE	TE)
* CIL R	ETE	NT:	ION :	RAT	IONAL	E:	(I	f a	pp	ol i	.ca				UATE UATE]	
REMARKS THE IOA NASA SC	AN			NAS	A ARE	I	N A	.GRE	EΜ	IEN	T.	THI	2	EOA	AGR	EES	W	ITH	THE

ASSESSMEI ASSESSMEI NASA FME	NT I	D:	12/10 EMU-2 115-F	66				:	NASA DATA BASELINI NEV]
SUBSYSTEM MDAC ID:	M:		EMU 266 SHEAR	PLA	TE A	SSEMB	LY				
LEAD ANA	LYST	· •	G. RA	FFAE	LLI						
ASSESSMEN	T:										
C	F	ICALI LIGHT	ľ	R:		DANCY B			2	CIL	
NASA IOA		•]	[[P]				_	[X [X] *
COMPARE	[/]	[N]	[N]	[]	1]	[]
RECOMMENI	ITAC	ONS:	(If	dif	fere	nt fr	om Ni	ASA)			
	[/]	[]	[]	[[[] ELETE)
* CIL RET	ENT	ION F	NOITAS	ALE:	(If	appl	icab]	A	ADEQUATE ADEQUATE	[]

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMEN ASSESSMEN NASA FME	TN	ID:	12/10 EMU-2 115-F	63					ASA DATA BASELINE NEW]	
SUBSYSTEMDAC ID:	M:		EMU 263 SHEAR	PL#	TE A	SSEMBI	LY (]	TEM 3	115)			
LEAD ANA	LYS:	r:	G. RA	FFAI	ELLI							
ASSESSME	NT:											
		TICAL FLIGH		I	REDUN	DANCY	SCRI			CIL		
	H	DW/FU	NC	1	Ą	В		С				
NASA IOA	[:	2 /2 2 /2]	[]] P]	[[P]	[N] A]	[X]] *	t
COMPARE	[/]	[]	N]	[N	3	[N	3	[]	
RECOMMEN	DAT	ions:	(I:	f di:	ffere	ent fro	om N.	ASA)				
	[/]	[]	[]	[] (<i>P</i>	[ADD/D		ΓE)
* CIL RE	TEN	TION	RATIO	NALE	: (If	appl	icab	Α	DEQUATE DEQUATE]	
REMARKS:	AND	THE	NASA A	ARE	IN AC	REEME	NT.					

ASSESSMI ASSESSMI NASA FMI	ENT	ID:	EMU	/10/8 J-264 5-FM8	6						NASA BAS	ELIN]	
SUBSYSTE MDAC ID:	– -		EMU 264 SHE		LAC	re .	ASSI	EME	BLY	(ITE	M 115)				
LEAD ANA	LYS	ST:	G.	RAFF	AE1	LLI										
ASSESSME	NT:															
		TICA FLIG IDW/F			RI A	EDU	NDAN	ICY E		REEN	s c			IL FEM	ſ	
NASA IOA	[2 /2 2 /2]	[P]	[P]	[] NA]		[X X]	*
COMPARE	[/]	[N]	[N]	[N]		[]	
RECOMMEN	DAT	IONS	: (If di	.ff	ere	∍nt	fr	om N	NASA)						
	[/]	£]	[]	[]	(A	[.DD/	'DE] LE	TE)
* CIL RE REMARKS: THE IOA										·	ADEQU IADEQU		[]	
TILL TON	מונח	Tur	NADA	AKL	ΤIJ	ΑC	KLL	ME.	N.T.							

ASSESSME ASSESSME NASA FME	TNE	II		EM	/10/ W-26 .5-FN	57	5									DATA ELINE NEW		х]	
SUBSYSTEMDAC ID:				EM 26 SH		PI	LAT	CE Z	ASS	EM	BI	'Υ								
LEAD ANA	ALY	ST	:	G.	RAI	FF	ΑEJ	LLI												
ASSESSMI	ENT	:																		
		F	ICAI LIGH W/FU	IT	?		RI A	EDU	NDA	NC	Y B	SCR	EEN	s c				I L FEI	M	
NASA IOA			-			[P]		[P]	[P]		[x]	*
COMPARE	[N	/N]		[N]		[N]	[N]		[N]	
RECOMME	NDA	TI	ONS:	:	(If	đ.	if:	fer	ent	: f	ro	om N	ASA)						
	[/]		[)		[]	[]	(2] ADD	/D	EL:	ETE)
* CIL R		NT	ION	RAT	TION	AL	E:	(I	f a	pp	13	icab			_	UATE UATE	_]	

THE IOA AGREES WITH THE NASA FINDINGS.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-271			DATA: ELINE [] NEW [X]
MDAC ID:	EMU 271 EVA POSITI	ION SWITCH	(ITEM 116)	
LEAD ANALYST:	G. RAFFAEI	LLI		
ASSESSMENT:				
FLIGHT		EDUNDANCY	SCREENS	CIL ITEM
HDW/FU	IC A	В	С	
NASA [2 /2 IOA [2 /2] [] [P] [] [F] []]	[X] * [X]
COMPARE [/] [N] [N	ן א) (ו	[]
RECOMMENDATIONS:	(If diff	erent fro	m NASA)	
[/] [] [] []	[] (ADD/DELETE)
* CIL RETENTION F	RATIONALE:	(If appli		
REMARKS:			ADEQU INADEQU	
THE IOA AND THE N	ASA ARE IN LILURE MODE	AGREEMEN' READILY	T. THE IOA DETECTABLE.	ALSO NOW

ASSESSMEI NASA FME	T ID	: E	EMU-27 L16-FM	2					BASELINE NEW			
SUBSYSTEM MDAC ID: ITEM:	M:	2	EMU 272 EVA PO	SIT	ION :	SWITC	CH (I	TEM 1	L6)			
LEAD ANA	LYST:	C	. RAF	FAE	LLI							
ASSESSME	NT:											
•	CRITI	CALIT	ĽΥ	R	EDUN	DANCY	SCR	REENS		CIL		
		/FUNC	2	A		F	3	С				
NASA IOA	[2 ,	/2 /2]]	[[P]] []] []	[[P]	[X] *]	
COMPARE	[,	/ :]	[N]	[]	1]	[N]	[]	
RECOMMEN	DATIO	NS:	(If	dif	fere	nt fi	om N	IASA)				
	[,	/ :]	[]	[]	[] (A	[DD/D] ELETI	Ξ)
* CIL RE	TENTI	on R	ATIONA	LE:	(If	app]	licab	Al	DEQUATE DEQUATE	_]	
REMARKS: THE IOA										THE	IOA	MOM

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-275			NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 275 BLEED OF	RIFICE ((ITEM 120A)		
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL: FLIGHT	TTY T	REDUNDA	ANCY SCREEN	S	CIL ITEM
HDW/FU		A	В	С	11111
NASA [3 /1R IOA [3 /2R] [P] P]	[F] [P] P]	[] * [x]
COMPARE [/N] []	[] [1	[N]
RECOMMENDATIONS:	(If di	ifferent	from NASA)	
[3 /2R] [3	[] [] (AI	[] DD/DELETE)
* CIL RETENTION F	RATIONALE	E: (If a	pplicable)		
			II	ADEQUATE NADEQUATE	
REMARKS:	mu muw w	IACA COD	DEEN D ACCT		T.O. T.V.
THE IOA AGREES WI AGREEMENT WITH TH					
RECOMMENDS A "3/2 RELIEF VALVES SUC IOA	R" TO AC	CCOUNT F	OR FAILURE	OF THE RED	
DOES NOT CONSIDER	THE SOF	AS RED	UNDANT TO	THIS ITEM.	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-274 120A-FM2			NASA DATA: BASELINE NEW	
MDAC ID:	EMU 274 BLEED O	RIFICE	(ITEM 120A)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL		REDUND	ANCY SCREE	ns	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [2 /1R IOA [2 /1R] [P] P]	[P] [F]	[P] [P]	[X] *
COMPARE [/] [1	[N]	[]	[]
RECOMMENDATIONS:	(If d	ifferen	t from NAS	SA)	
[/] []	[]	[] (A	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If	applicable	e) ADEQUATE INADEQUATE	
REMARKS: THE IOA AND THE REGARDING WHICH	NASA ARE	IN AGE	REEMENT EX	CEPT ON SCRE	EN B,

ASSESSMI ASSESSMI NASA FMI	ENT	'I	D:	E	2/10, MU-2 20A-1	73								ASA DA BASELI		[]	
SUBSYSTI MDAC ID: ITEM:				2	MU 73 LEED	01	RI	FICE	E (I	TE	M 1	20A)						-	
LEAD ANA	/LY	ST	:	G	. RAI	FFA	ΑE	LLI											
ASSESSME	ENT	:																	
		F	LIG		ľ		R A	EDUN	DAN		sc	REEN					CL CEM	1	
			•							В			С						
NASA IOA	[2	/11	R] R]		[P P]	[P P]	[P P]]	X X]	*
COMPARE	[/]		[]	[]	C]		[]	
RECOMMEN	'DA'I	ΓIC	ONS:	:	(If	di	fí	ere	nt :	fro	om 1	NASA))						
	[/]		[]	[]	Į.			(AD	[D/	DE] LE	TE)
* CIL RE	TEN	ITI	ON	RAT	IONA	LE	:	(If	app	pli	.cal	ole)	AD	EQUAT	E	ſ		1	
REMARKS: THE IOA	AND) T	'HE	NAS.	A AR	E :	IN	AGI	REEN	IEN	T.	IN		EQUATI		[j	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-276 120B-FM1			ELINE [] NEW [X]
	EMU 276 DUAL MODE	RELIEF V	ALVE (ITEM 1	20B)
LEAD ANALYST:	G. RAFFAE	LLI		
ASSESSMENT:				
	ITY R	EDUNDANCY	SCREENS	CIL ITEM
FLIGH HDW/FU		В	С	112.1
NASA [2 /1R IOA [2 /1R] [P] [P] [F] [P]] [P]	[X] * [X]
COMPARE [/] [] [N] []	[]
RECOMMENDATIONS:	(If dif	ferent fr	om NASA)	
[/] [] [] []	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE:	(If appl	ADEÇ	PUATE []
REMARKS: THE IOA CONCURS	WITH THE N	ASA SCREE	N B ASSIGNME	ENT AND IS IN FULI

AGREEMENT WITH THE REMAINING ANALYSIS.

ASSESSMI ASSESSMI NASA FMI	ENT	I		EN	2/10 MU-2 20B-	77		FM3	3					ASA BASI	ELIN		X]	
SUBSYSTI MDAC ID: ITEM:				EN 27 DU		MO	DE	REI	LIEF	V.	ALVI	E (1	TE	M 12	20B)				
LEAD AND	ALY	ST	:	G.	RA:	FF	AE:	LLI											
ASSESSMI	ENT	:																	
		F	ICAL: LIGH! W/FUI	r	?		Ri A	EDUN	IDAN	CY B	SCI	REEN	s c				IL TE		
			•																
NASA IOA	[2	/1R /1R]		[P P]	[P P]	[[P P]]	X X]	*
COMPARE	[/]		[]	[]	[]		[]	
RECOMMEN	IDA!	ric	ONS:		(If	d:	if	fere	nt :	fro	m c	IASA)						
	[/]		[]	[]	[]	(.] ADD	/DI] ELI	ETE
* CIL RERESTREMARKS:												·		DEQU DEQU]	
										_									

	12/10/86 EMU-279 120B-FM4		BASELINE NEW	[x]
SUBSYSTEM: MDAC ID: ITEM:	EMU 279 DUAL MODE	RELIEF VALV	E (ITEM 120B)	
LEAD ANALYST:	G. RAFFAEL	LI		
ASSESSMENT:				
CRITICAL: FLIGH		DUNDANCY SC	REENS	CIL ITEM
HDW/FU		В	С	
NASA [3 /1R IOA [2 /1R] [P [P] [NA]] [P]	[P] [P]	[X] * [X]
COMPARE [N /] [] [N]	[]	[]
RECOMMENDATIONS:	(If diff	erent from	NASA)	
[/] [] [P]	[] (AI	[] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If applica	ble) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AGREES W REDUNDANCY GROUN	ITH THE NAS DRULES AND	SA SCREEN B IS IN FULL	ASSIGNMENT DUE AGREEMENT WITH	TO STANDBY THE NASA

ANALYSIS CRITICALITY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-278	1		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:		DE RELII	EF VALVE	(ITEM 120B)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAI FLIGH		REDUNDA	NCY SCRE	ens	CIL
	NC	A	В	С	ITEM
NASA [3 /3 IOA [3 /2F] [p]	[] [F]	[] [P]	[x] *
COMPARE [/N] [N]	[N]	[N]	[N]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[3 /2R] [P]	[NA]		[A] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicable	e) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AND THE REGARDING FUNCTI REFLECT THE MISS FAILURE. ADDITI AS SHOWN ABOVE.	ONAL CRI' ION IMPA	TICALITY CT RESUL	, THE IOA	RITICALITY; A RECOMMENDS I REDUNDANT	HOWEVER, A "2R" TO FUNCTION

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/8 EMU-282 120C-FM	:	NASA DATA BASELINE NEW							
SUBSYSTEM: MDAC ID: ITEM:	EMU 282 FEEDWAT	ER CHEC	K VALVE (ITEM 120C)						
LEAD ANALYST:	G. RAFF	AELLI								
ASSESSMENT:										
CRITICA FLIG HDW/F		REDUND.	ANCY SCRE	ens C	CIL ITEM					
NASA [2 /1 IOA [2 /1	R] [P]	[P] [P]	[P] [P]	[X] * [X]					
COMPARE [/] []	[]	[]	[]					
RECOMMENDATIONS	: (If d	lifferen	t from NA	SA)						
[/] [.)	[]	[] (A	[] DD/DELETE)					
* CIL RETENTION	RATIONAI	LE: (If	applicabl	e) ADEQUATE INADEQUATE	•					
REMARKS:					_					

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/86 EMU-281 120C-FM2			NASA DATA BASELINE NEW		
	EMU 281 FEEDWATER	CHECK	VALVE (ITEM 120C)		
LEAD ANALYST:	G. RAFFAE	LLI				
ASSESSMENT:						
CRITICAI FLIG	LITY R	EDUNDAN	CY SCRE	CIL ITEM		
HDW/FU	JNC A		В	С		
NASA [3 /3 IOA [3 /1] [P] [F]	[] [P]	[] * [X]	
COMPARE [/N] [и] [ן א	[N]	[N]	
RECOMMENDATIONS:	(If dif	ferent	from NA	SA)		
[/] [] [1		[] DD/DELETE)	
* CIL RETENTION	RATIONALE:	(If ap	plicable	e) ADEQUATE INADEQUATE	[]	
REMARKS: THE IOA CONCURS	WITH THE NA	ASA FIN	DINGS.			

ASSESSMEN ASSESSMEN NASA FME	T ID		12/10/ EMU-2: 120C-:	80	BASELIN								INE]	
SUBSYSTEM MDAC ID: ITEM:	4:		EMU 280 FEEDW	ATE	ER	CHEC	cĸ	VAI	LVE (3	[TI	EM	120C))				
LEAD ANA	LYST:		G. RA	FFA	ÆΙ	LI											
ASSESSME	T:																
•	CRITI	CAL			RI	EDUNE	DAN	CY	SCRE	ENS	5			CII			
	_	/FUI			A			В			С						
NASA IOA	[2 [2	/1R /1R]	[P P]	[P P]	[P P]		[3	ζ ζ]]	*
COMPARE	[/	1	[•]	[)	[1		[]	
RECOMMEN	DATIC	NS:	(If	d:	if	fere	nt	fr	om NA	SA)						
	[/	3	[3	{	•]	[]	(A	[DD/1	DΕ] LE	TE)
* CIL RE	TENTI	ON :	RATION	ALI	Ε:	(If	aŗ	pl	icabl			DEQUA DEQUA]	
REMARKS:														-		-	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-201		NASA DATA: BASELINE [] NEW [X]							
SUBSYSTEM: MDAC ID: ITEM:	EMU 201 CHECK V	ALVE A	ND VENT F	LOW SENSOR	R (ITEM 121)					
LEAD ANALYST:	G. RAFF	AELLI								
ASSESSMENT:										
FLIGHT	r	DANCY SCR	CIL ITEM							
HDW/FU	NC.	A	В	С						
NASA [2 /1R IOA [2 /2] [P] P]	[F] [F]	[P] [P]	[X] * [X]					
COMPARE [/N] []	[]	[]	[]					
RECOMMENDATIONS:	(If di	iffere	nt from N	ASA)						
\]] []	[]	[]	[] (ADD/DELETE)					
* CIL RETENTION F	RATIONALE	E: (If	applicab	le) ADEQUA INADEQUA						
REMARKS: THE IOA AND THE NADDITIONALYY, THE FUNCTIONAL CRITIC	IOA AGR	EEN ASS REES WI	SIGNMENTS TTH THE N	ARE IN AG	REEMENT					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-199 121-FM2		NASA DATA: BASELINE NEW	[x]
SUBSYSTEM: MDAC ID: ITEM:	EMU 199 CHECK VALVE	E AND VENT FLOW	SENSOR (IT	PEM 121)
LEAD ANALYST:	G. RAFFAELI	LI		
ASSESSMENT:				
CRITICAL		DUNDANCY SCREENS		CIL ITEM
FLIGHT HDW/FU		В	С	TIEN
NASA [2 /2 IOA [2 /2] [P] [] [] [F] [] P]	[X] * [X]
COMPARE [/] [N]] [и] [и]	[]
RECOMMENDATIONS:	(If diffe	erent from NASA)		
[/] [] [] [] (AD	[] D/DELETE)
* CIL RETENTION	RATIONALE:		ADEQUATE ADEQUATE	
REMARKS: THE IOA AND THE	NASA ARE IN	AGREEMENT.		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-198 121-FM3	BASELINE []								
SUBSYSTEM: MDAC ID: ITEM:	EMU 198 CHECK VALVE AN									
LEAD ANALYST: G. RAFFAELLI										
ASSESSMENT:										
CRITICALI FLIGHT	DANCY SCREENS		CIL ITEM							
HDW/FUN	NC A	В	С							
NASA [2 /1R IOA [2 /1R] [P]] [P]	[P] [[P] [P] P]	[X] *						
COMPARE [/] []	[] [1	[]						
RECOMMENDATIONS:	(If differen	at from NASA)								
[/] []	[] [[] DD/DELETE)						
* CIL RETENTION R REMARKS: THE IOA AND THE N		IN	ADEQUATE ADEQUATE	[]						

ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-200 NASA FMEA #: 121-FM4 NASA DATA: BASELINE [] NEW [X]
SUBSYSTEM: EMU MDAC ID: 200 ITEM: CHECK VALVE AND VENT FLOW SENSOR (ITEM 121)
LEAD ANALYST: G. RAFFAELLI
ASSESSMENT:
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM
HDW/FUNC A B C
NASA [2/2] [] [] [X]* IOA [2/2] [P] [F] [F] [X]
COMPARE [/] [N] [N] [N]
RECOMMENDATIONS: (If different from NASA)
[/] [] [] (ADD/DELETE)
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []
REMARKS: THE IOA AND THE NASA ARE IN AGREEMENT.

	EMU-197 BASELINE									
	97									
LEAD ANALYST: G. RAFFAELLI										
	ANCY SCR	EENS	CIL ITEM							
NC I	A B C									
] []	P] P]	[P] [P]	[P] [P]	[X] * [X]						
] []	[]	[]	[]						
(If di	fferent	t from N	ASA)							
] []	[]		[] ADD/DELETE)						
			le) ADEQUATE INADEQUATE							
	EMU-197 121-FM5 EMU 197 CHECK VA G. RAFFA ITY I I I I I I I I I I I I I I I I I	EMU 197 CHECK VALVE AN G. RAFFAELLI ITY REDUNDA I NC A [P] [P]] (If different] [] RATIONALE: (If a	EMU-197 121-FM5 EMU 197 CHECK VALVE AND VENT F G. RAFFAELLI ITY REDUNDANCY SCR I NC A B [P] [P]] [P]] [P] [Q] (If different from N] [] []	EMU-197 121-FM5 EMU 197 CHECK VALVE AND VENT FLOW SENSOR (G. RAFFAELLI ITY REDUNDANCY SCREENS FNC A B C [P] [P] [P] [P] [P] [P] [P] [P] [P] [MC						

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/86 EMU-204 122-FM1	-204 BASELINE								
SUBSYSTEM: MDAC ID: ITEM:	EMU 204 CO2 TRANS	DUCER (I	TEM 122)						
LEAD ANALYST:	G. RAFFAE	LLI								
ASSESSMENT:										
CRITICA		EDUNDANC!	SCREE	NS	CIL ITEM					
FLIG HDW/F		. 1	В	С						
NASA [2 /2 IOA [2 /2] [] [P] [] F]	[] [AN]	[X] * [X]					
COMPARE [/] [N	[]	N]	[и]	[]					
RECOMMENDATIONS	: (If dif	ferent f	rom NAS	A)						
[/] [] []	[] (A	[] .DD/DELETE)					
* CIL RETENTION	RATIONALE:	(If app	licable	ADEQUATE						
REMARKS: THE IOA AND THE	NASA ARE J	IN AGREEM	ENT.							

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	EMU-205		NASA DATA: BASELINE [NEW [X						
SUBSYSTEM: MDAC ID: ITEM:	EMU 205 CO2 TRANS	SDUCER (1	TEM 122)						
LEAD ANALYST:	G. RAFFAI	ELLI							
ASSESSMENT:									
FLIG		REDUNDANC	CY SCREEN	s	CIL ITEM				
HDW/FU	INC A	A	В	С					
NASA [2 /1F IOA [3 /1F	[F	9] [F] [P] P]	[X] * [X]				
COMPARE [N /] [] [] []	[]				
RECOMMENDATIONS:	(If dif	ferent f	rom NASA))					
[/] [] [] [] (A	[] DD/DELETE)				
* CIL RETENTION	RATIONALE:	(If app	licable)						
REMARKS:			·	ADEQUATE IADEQUATE	[]				
THE IOA AND THE CRITICALITY ASSI	GNMENT. T	HE IOA N	ENT EXCER	T FOR HAR	DWARE HARDWARE				

ASSESSME ASSESSME NASA FME	NT I	D:	8/06/8 EMU-71 122-FM	.6X				1	NASA 1 BASE:		[]	
SUBSYSTE MDAC ID:	M:		EMU 716 CO2 TF	RANSI	UCER	(ITI)	EM 122)					
LEAD ANA	LYST	::	G. RAI	FAEI	LI								
ASSESSME	NT:												
	F	CICALI LIGHT	r	RI A	EDUND	ANCY B	SCREE		С		CIL		
NASA IOA		•]	[P]	[F]	[P] P]		[X]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	(If	dif	feren	t fr	om NAS	SA)					
	[/]	[]	[]	[3	(Al	[DD/E] ELE	TE)
* CIL RE		rion 1	RATION	ALE:	(If	appl	icable		ADEQU ADEQU		[]	
REMARKS:													

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMI ASSESSMI NASA FMI	ENT I	ID:	EMU-	-206						DATA ELINE NEW]	
SUBSYSTE MDAC ID:			EMU 206 CO2	TRANS	DUCE	R (IT	EM .	122)					
LEAD ANA	LYSI	:	G. R	AFFAE	LLI								
ASSESSME	ENT:												
		CICAL LIGH	ITY T	R	EDUN	DANCY	sci	REENS			CIL		
			NC	A	•	В		(С		1111	M	
NASA IOA	[2 [2	/1R /1R]	[P [P]	[F [P]	[]	P]		[X]	*
COMPARE	[/]	[]	[N]	[]		[]	
RECOMMEN	DATI	ONS:	(I	f dif	fere	nt fr	om 1	NASA)					
	[/]	[]	ſ]	ſ]	(Al	[DD/D		ETE)
* CIL RE	TENT	I NOI	RATIO	NALE:	(If	appl	icak	ole)					
REMARKS:										IATE IATE]	
THE IOA WITH THE	AND NAS	THE I	NASA . REEN :	ARE I	N AGI	REEMEN ENT.	T.	THE	IOA	ALSO	FUL	ĽΥ	AGREES

	12/10/86 EMU-203 122-FM5			NASA DATA: BASELINE NEW	
MDAC ID:	EMU 203 CO2 TRANS	SDUCER	(ITEM 122)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDA	NCY SCREE	NS	CIL ITEM
HDW/FU		A	В	С	
NASA [2 /1R IOA [2 /1R] [P] P]	[P] [P]	[P] [P]	[X] * [X]
COMPARE [/] [)	[]	[]	[]
RECOMMENDATIONS:	(If di	fferent	from NAS	A)	
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* CIL RETENTION	RATIONALE	E: (If a	applicable	e) ADEQUATE INADEQUATE	_
REMARKS: THE IOA AND THE	NASA ARE	IN AGRI	EEMENT.		

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	EMU-185	5			NASA D BASEL]
SUBSYSTEM: MDAC ID: ITEM:	EMU 185 FAN (ITE	EM 123	A)					
LEAD ANALYST:	G. RAFFA	ELLI						
ASSESSMENT:								
CRITICAL FLIGH	HT			SCREE			IL TEM	
HDW/F	JNC	A	В		С			
NASA [2 /11 IOA [2 /11	8] [P] P]	[P [P] [[P] [P]]	X] X]] *]
COMPARE [/] []	[) [. j	[])
RECOMMENDATIONS:	(If di	ffere	nt fro	m NASA	7)			
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* CIL RETENTION	RATIONALE	: (If	appli	cable)				
					ADEQUAT NADEQUAT]	
REMARKS: THE IOA AND THE	NASA ARE	IN AGI	REEMEN		DDQUA	ם [J	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-187			NASA DATA: BASELINE NEW	
	EMU 187 BRUSHLES	ss motor	(ITEM 12	3B)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL FLIGH	CIL ITEM				
	NC	A	В	С	
NASA [2 /1R IOA [2 /1R] [P] P]	[P] [P]	[P] [P]	[X] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)	
[/] []	[]	[] (A)	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicable	e) אריר פון אידר	r 1
				ADEQUATE INADEQUATE	
REMARKS: ALTHOUGH THE IOA RECOMMENDED THAT THE DROPS IN SPE ANALYSIS.	THE "FA	ILED OFF	" FAILURE	MODE BE SE	PARATED FROM

ASSESSMI ASSESSMI NASA FMI	ENT I	D:	EMU-1	38					ASA DAT BASELIN NE]	
SUBSYSTE MDAC ID:			EMU 188 BRUSH	LESS	S MOT	OR (I	TEM	123B)				
LEAD ANA	LYSI	7:	G. RAI	FFAI	ELLI							
ASSESSME	ENT:											
		ICAL	ITY r	I	REDUN	DANCY	SCF	REENS		CIL		
			1C	2	A	В	,	C		ITE	M	
NASA IOA	[2 [2	/1R /1R]	[]	?] ?]	[P]	[P [P]	(X (X] *	ŧ
COMPARE	[/]	[]	[]	[]	[]	
RECOMMEN	IDATI	ons:	(If	dif	ffere	nt fr	om N	IASA)				
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* CIL RE	TENT	'ION F	RATIONA	LE:	(If	appl	icab	AL	DEQUATE	Ĩ]	
REMARKS: THE IOA WOULD RE THE MOTO	AND COMM	END S	EPARAT	'ION	OF :	NERAL THIS	AGR FAII	REEMENT	DEQUATE T; HOWEY DDE (LOV	/ER, '	THE	IOA FROM

	ASSESSME ASSESSME NASA FME	NT I	D:	EMU	10/86 -190 -FM11					SA DATA ASELINE NEW	[X]	
	SUBSYSTE MDAC ID:			EMU 190 BRU	SHLESS	MOT	OR (I	TEM	123B)					
	LEAD ANA	LYST	':	G.	RAFFAE	LLI								
	ASSESSME	ENT:												
			'ICAL 'LIGH		R	EDUN	IDANCY	SCI	REENS		CI	L EM	[
			W/FU		A		В		С					
	NASA IOA		2 /1R 2 /1R		[F)]	[P]	[P [P]	[X X]	*
	COMPARE	[/]	£]	[]	[]	[]	
	RECOMME	TADN	cons:	(If dif	fere	ent fr	om 1	NASA)					
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REMARKS:

THE IOA AND THE NASA ARE IN AGREEMENT.

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SUBSYST: MDAC ID ITEM:				EM 75 FA		ÀR	'ATC	OR/P	UM	IP,	/MO	TOR	AS	SEN	ÍBLY					
LEAD AND	ALY	ST	:	G.	RAFF	ΆE	LLI	Ţ												
ASSESSMI	ENT	:																		
		F	LIG					INDA	NC	Y	SC	REEN	S					IL CEM	ſ	
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NASA IOA]	1	/1 /1]]	P]		[F]]	P]]	X X]	*
COMPARE	[/]	[N]		[]	N]	[N]			[]	
RECOMMEN	[ADI	ľIC	ons:	: ((If d	ifi	fer	ent	f	ro	m 1	NASA))							
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REMARKS:															UATE UATE		:]	
THE IOA	AND	T	ΉE	NASA	ARE	IN	I A	GREE	ME	EN'	Г.									

ASSESSMEN ASSESSMEN NASA FMEA	1T	II		EM	U-71	.73	ζ.										DA ELI N		[]	
SUBSYSTEM MDAC ID: ITEM:	1:			EM 71 FA		TI	EM	12	3A)													
LEAD ANAI	LYS	ST	:	G.	RAF	F/	ÆΙ	LI														
ASSESSMEN	T!	:																				
(CR		ICAL:				RI	DU	NDA	N	CY	sc	REE	NS	3					L PEN	٧ī	
	I		/FUI				A				В				С						•	
NASA IOA	[2 1	/1R /1]		[P F]		[P F]		[P P]]	X X]	*
COMPARE	[N	/N]		[N]		[N]		[]			[]	
RECOMMEN	DA!	rio	ons:		(If	d :	ifi	fer	ent	: :	fro	om	NAS	A))							
	[/	3		[]		[]		[]		(A	DD,	/DI] ELI	ETE)
* CIL RE	ΓEI	NT:	ION 1	RAT	IONA	L	Ξ:	(1	∶f a	p	p1 :	ica	able				LAU LAU		[]	
REMARKS: UPON FUR	ΓH	ER	REV:	IEW	, TI	ΙE	I	ΟA	AGF	æ	ES	W	TH	TI	ΗE	NA	SA	AN.	AL:	YS:	IS.	•

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		MU-184 BASELINE					
	EMU 184 FAN (ITEM	I 123A)					
LEAD ANALYST:	G. RAFFAE	LLI					
ASSESSMENT:							
CRITICAL: FLIGHT		EDUNDANC	Y SCREEN	s	CIL ITEM		
HDW/FUN	IC A	. 1	3	С	11011		
NASA [2 /1R IOA [2 /1R] [P] []	5] [P] P]	[X] * [X]		
COMPARE [/] [] [] []	[]		
RECOMMENDATIONS:	(If dif	ferent fi	com NASA)			
[/] [] [] [] (AI	[] DD/DELETE)		
* CIL RETENTION F REMARKS: THE IOA AND THE N			I	ADEQUATE NADEQUATE	[]		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DATA: BASELINE NEW	
MDAC ID:	EMU 178 ROTARY H20	o separa	TOR (IT	EM 123 B)	
LEAD ANALYST:	G. RAFFAE	LLI			
ASSESSMENT:					
CRITICAL: FLIGH		EDUNDANC	Y SCREE	ns	CIL ITEM
HDW/FU			В	С	
NASA [2 /1R IOA [2 /1R] [P] [P] F /]	[P] [F]	[X] *
COMPARE [/] [] [n]	[N]	[]
RECOMMENDATIONS:	(If dif	ferent f	from NAS	A)	
[/] [] [F]	[F] (A	[] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If app	olicable	e) ADEQUATE INADEQUATE	[]
REMARKS:		·	ANTAT VCTC		A ASSTONMEN

THE IOA AND THE NASA CRITICALITY ANALYSIS AND SCREEN A ASSIGNMENT ARE IN AGREEMENT. HOWEVER, THE IOA BELIEVES WATER CARRYOVER INTO THE HELMET AND SSA IS AN UNDESIRED EFFECT AND SHOULD NOT BE CONSIDERED A DETECTION TECHNIQUE. AS SUCH THE IOA RECOMMENDS FAILURE OF SCREEN B. ADDITIONALLY, BECAUSE WATER MAY FREEZE IN EITHER OR BOTH PURGE VALVES AND CAUSE LOSS OF REDUNDANCY THE IOA RECOMMENDS FAILURE OF SCREEN C.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-182		NASA DATA: BASELINE NEW	
	EMU 182 WATER PUMP (ITEM 123C)		
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICAL] FLIGHT		NDANCY SCREENS		CIL
	IC A	В	С	ITEM
NASA [2 /2 IOA [2 /1R] []]	[] [[P] [] P]	[X] * [X]
COMPARE [/N] [N]	[и]	N]	[]
RECOMMENDATIONS:	(If differ	ent from NASA)		
[2 /1R] [P]	[P] [:	P] (AD	[] D/DELETE)
* CIL RETENTION R	ATIONALE: (I	·		
REMARKS:		IN	ADEQUATE ADEQUATE	[]
WITH THE EXCEPTION AS ARE IN AGREES OP OPERATION AS "IR" IS RECOMMEND	MENT. BECAUS REDUNDANT FUN	SE THE IOA CON: NCITONS. A FUNC	SIDERS VEN	T FLOW AND

ASSESSMENT ID:	12/10/86 EMU-179 123-FM6		NASA DATA: BASELINE NEW	[x]
MDAC ID:	EMU 179 ROTARY H2C	SEPARATOR (I	TEM 123 B)	
LEAD ANALYST:	G. RAFFAEI	LI		
ASSESSMENT:				
CRITICALI FLIGHT		EDUNDANCY SCRE	ens	CIL ITEM
HDW/FUN		В	С	
NASA [2 /1R IOA [2 /1R] [P] [P] [P]] [P]	[P] [P]	[X] * [X]
COMPARE [/] [] []	[]	[]
RECOMMENDATIONS:	(If dif	ferent from NA	SA)	
[/] [] []	[]	[DD/DELETE)
* CIL RETENTION	RATIONALE:	(If applicabl	e) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AND THE 1 181)	NASA ARE I	N AGREEMENT.	(ALSO REFERE	NCE MDAC ID-

ASSESSMENT I ASSESSMENT I NASA FMEA #:	ID: EMU	10/86 1-181 -FM6		NASA I BASEI	DATA: LINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	EMU 181 WAT		TEM 123C)	
LEAD ANALYST	: G.	RAFFAELLI			
ASSESSMENT:					
F	CICALITY CLIGHT OW/FUNC	REDUN A	DANCY SCI	REENS C	CIL ITEM
NASA [2 IOA [2	/1R] /1R]	[P] [P]	[P] [P]	[P] [P]	[X] * [X]
COMPARE [/]	[]	[]	[]	[]
RECOMMENDATI	ONS: (If differe	nt from N	IASA)	
(/]	[]	[]	[]	[] (ADD/DELETE)
* CIL RETENT	ION RATIO	ONALE: (If	applicab	ole) ADEQUAT INADEQUAT	re []
THE IOA AND	THE NASA	ARE IN AGE	REEMENT (REF. MDAC	[D-179).

ASSESSME ASSESSME NASA FME	NT I	D:	12/10/86 NASA DAT EMU-183 BASELIN 123-FM7 NE]					
SUBSYSTE MDAC ID: ITEM:	М:		EMU 183 WAT	,	MU	P (II	EM	12	23C)							
LEAD ANA	LYST	:	G.	RAFI	`AEI	LLI										
ASSESSME	NT:															
	F	ICAL: LIGH' W/FU	r		RI A	EDUND)AN	CY B	SCR	EENS	s C			IL TE		
NASA IOA	[2	/1R /1R]	[P]	[P F]	[P P]	[X X]	*
COMPARE	[/]	(]	[N]	[]	[]	
RECOMMEN	DATI	ons:	(If d	lif	ferer	nt :	fro	om N	ASA))					
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* CIL RE	TENT	'ION	RATI	ONA	E:	(If	ap	pl:	icab			EQUATE	-]	
REMARKS:																

THE IOA AND THE NASA ARE IN GENERAL AGREEMENT; HOWEVER, THE IOA SUGGESTS THE EFFECTS BE MODIFIED TO REFLECT POSSIBLE MOTOR FAILURE DUE TO INTERNAL H20 LEAKAGE. ADDITIONALLY, THE IOA RECOMMENDS SCREEN B BE FAILED BECAUSE WATER CARRYOVER IS AN UNDESIRABLE EFFECT WHICH SHOULD NOT BE CONSIDERED A DETECTION TECHNIQUE.

ASSESSME ASSESSME NASA FME	NT	I	D:	EMU-1								[]					
SUBSYSTE MDAC ID: ITEM:				EMU 189 BRUSH	LE.	ss	MOT	OR	()	T	EM 1:	23	B)						
LEAD ANA	LY:	ST	:	G. RA	FF.	AE:	LLI												
ASSESSME	NT	:																	
CRITICALITY RE FLIGHT							EDUNDANCY SCREENS								CIL ITEM				
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NASA IOA	[2 2	/2 /1R]]	P]	[F	•]	[P]		[X X]	*
COMPARE	[/N]	[N]	[N]	[N	J		[]	
RECOMMEN	DA'	ric	ons:	(If	d:	ifi	fere	nt	fr	O1	m NAS	SA;)						
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* CIL RE	TEI	T	ON F	RATION	ALI	Ε:	(If	ap	pl	i	cable		AI IAI	EQUATI	E F.	[]	
REMARKS: THE NASA POWER COL LOSS AND CAN BE LA AND PASS	NSU RE OSI	JMI EQU	TION TREI THE	NEAR SOP I IOA '	M US! IHI	ISS AGE ERE	ION E.] EFORE	EN IF	D. TH	E	THIS	SS S (IBI CAN	LITY (RESU)	OF LT E C	E) IN	CI I I	ESS POW	VER

ASSESSMEN ASSESSMEN NASA FME	NΤ	II):	EM	/10/ U-18 3-FM	0								_	SA DATA ASELINE NEW	[
SUBSYSTEMDAC ID:	M:			EM 18 RO	0	Н	20	SEPA	RA	ΔTC	R	(ITI	EM	: 1	.23 B)					
LEAD ANA	LYS	ST:	:	G.	RAF	'FA	ΕL	LI												
ASSESSME	NT:	;																		
	CRI		ICAL LIGH					:DUND?	ANC		SC	REE	NS				IL TEN	1		
	I	IDI	W/FU	NC			A			В				С						
NASA IOA	[2	/2 /1R]		[P]]	P]] [F]	[X X]	*	
COMPARE	[/N]		[N)	[N]		[N)	[]		
RECOMMEN	IDA'	ΓI	ons:		(If	di	lfi	feren	t :	fro	om	NAS	A)	١						
	[2	/1R	2]		[P]	[P]		[F] (2		/D:		ETE)	
* CIL RE	ETE:	NΤ	ION	RAT	rion?	ALI	Ξ:	(If	ap	pl:	ica	ble			DEQUATE DEQUATE]		
REMARKS: THE IOA CRITICAL REDUNDAN FUNCTION ICING PURGE VA	AN LIT VT VAL	Y. FU	TC NCT] RIT]	O RI CONS CCA:	EFLE S (e LITY	CT • g • Al	TI ND	HE WO SOP), FAIL	RS' T' UR	T HE E	CAS IC OF	E S A R SCR	E	EN. COI EN	MMENDS . C (REF	A "	OS IR TS	Б ' '' Р	oss:	[BLE

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	EMU-186	5		NASA DAT BASELIN NE	
SUBSYSTEM: MDAC ID: ITEM:	EMU 186 BRUSHLE	ess moto	R (ITEM	123B)	
LEAD ANALYST:	G. RAFF	'AELLI			
ASSESSMENT:					
CRITICA: FLIG	LITY HT	REDUND	ANCY SCR	EENS	CIL ITEM
HDW/F	JNC	A	В	С	TIEM
NASA [2 /2 IOA [2 /1] [p]	[] [P]	[] [P]	[X] * [X]
COMPARE [/N] [и ј	[N]	[N]	[]
RECOMMENDATIONS:	(If d	ifferent	from N	ASA)	
[2 /1	?] [P]	[P]		[] ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicab]		
REMARKS:				ADEQUATE INADEQUATE	[]
THE IOA AND THE CRITICALITY. TO INCLUDE H20 CARRA "1R" CRITICALI	YOVER FRO	THE WOR	ST CASE	SCENARIO (WE	IICH CAN

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-147		NASA DATA BASELINE NEW		
SUBSYSTEM: MDAC ID: ITEM:	EMU 147 PITOT ACT	ruated V	ALVE (ITI	EM 125)	
LEAD ANALYST:	G. RAFFAI	ELLI			
ASSESSMENT:					
CRITICAL		REDUNDAN	CY SCREE	15	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [3 /1R IOA [2 /2	[]	P] [P] [NA] F]	[P] [P]	[x] *
COMPARE [N /N] [] [N]	[]	[N]
RECOMMENDATIONS:	(If di	fferent	from NAS	A)	
[/] [] [F]	[] (A)	[A] DD/DELETE)
* CIL RETENTION	RATIONALE	: (If ap) ADEQUATE INADEQUATE	
REMARKS: THE IOA AND THE	NASA ARE	IN AGREE	MENT ON	THE SCREEN	A AND C

ASSIGNMENTS; HOWEVER, THE INITIAL IOA CRITICALITY ASSIGNMENT DID NOT AGREE WITH THAT OF NASA. AFTER FURTHER REVIEW, THE IOA NEW AGREES WITH THE NASA CRITICALITY BUT WOULD MODIFY THE NASA SCENARIO TO INCLUDE POSSIBLE BLOCKAGE OF THE SEPARATOR PITOT OR THE 134 VALVE FAILING CLOSED. ADDITIONALLY, BECAUSE THE ITEM IS AN ACTIVE COMPONENT DURING THE MISSION, THE IOA RECOMMENDS FAILURE OF SCREEN B AND INCLUSION IN THE CIL.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-148	5		NASA DATA BASELINE NEW	
MDAC ID:	EMU 148 PITOT AC	CTUATED V	VALVE (I	ГЕМ 125)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICALI FLIGHT HDW/FUN	ŗ	REDUNDAN A	NCY SCREI	ENS C	CIL ITEM
NASA [2 /1R IOA [2 /1R] [P] [P] F]	[P] [P]	[X] *
COMPARE [/) [] [N]	[]	[]
RECOMMENDATIONS:	(If di	fferent	from NAS	SA)	
[/] [] [F]		[] DD/DELETE)
* CIL RETENTION R	ATIONALE	: (If ap	plicable	e) ADEQUATE INADEQUATE	[]
EXCEPT FOR SCREEN CRITICALITY AND S THE FAILURE READI	CREEN ASS	SIGNMENT	S. THE	IOA ALSO DOF	S NOT FIND

WATER CARRYOVER IS AN UNDESIRABLE EFFECT WHICH SHOULD NOT BE CONSIDERED A DETECTION TECHNIQUE. THE IOA ALSO RECOMMENDS REVIEW OF THE EFFECTS FOR THE POSSIBLE ADDITION OF EFFECTS RESULTANT FROM LOSS OF FAN SEPARATOR FUNCTION.

ASSESSMEN ASSESSMEN NASA FME	T ID	:	12/10/ EMU-14 125-FM	9					ASA DA BASELI N	NE		
SUBSYSTEM MDAC ID: ITEM:	1:		EMU 149 PITOT	ACTU	JATED	VAL	/E (I1	EM	125)			
LEAD ANAI	LYST:		G. RAF	FAEI	LI							
ASSESSMEN	1T:											
C		IGHT		RE A	EDUND	ANCY B	SCREE	ENS C			CIL	
NASA IOA		•]	[P]	[P]	[P]		[X] *
COMPARE	[/]	[]	£	1	[3		[]
RECOMMENI	DATIO	NS:	(If	diff	feren	t fro	om NAS	SA)				
	[/]	[]	[]	[]	(AI	[DD/D:] ELETE)
* CIL RE	PENTI	ON I	RATIONA	ALE:	(If	appl:	icable	A	DEQUAT DEQUAT		_]
REMARKS:												

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		50		NASA DATA BASELINE NEW	
	EMU 150 PITOT	ACTUATED	VALVE (I	TEM 125)	
LEAD ANALYST:	G. RAF	'FAELLI			
ASSESSMENT:					
CRITICAL FLIGH HDW/FU	T	REDUNDA A	NCY SCRE	ENS C	CIL ITEM
NASA [2 /2	1	ſĵ	r ı	r 1	
IOA [2 /1R	j	[] [P]	[F]	[P]	[X] * [X]
COMPARE [/N]	[N]	[N]	[N]	[]
RECOMMENDATIONS:	(If o	different	from NAS	SA)	
[2 /1R	1	[P]	[F]	[P]	[] DD/DELETE)
* CIL RETENTION	RATIONA	LE: (If a	pplicable	ADEQUATE INADEQUATE	
REMARKS:				THADEQUATE	[]
THE IOA AGREES W	ITH THE	NASA ANA	LYSIS.		

ASSESSMENT WORKSHEET

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-151 125-FM4			BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 151 PITOT AC	TUATED	VALVE (IT	'EM 125)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICA: FLIG		REDUNDA	NCY SCREE	ens	CIL ITEM
HDW/F		A	В	С	
NASA [2 /2 IOA [2 /1] [R] [] P]	[P]	[] [P]	[X] * [X]
COMPARE [/N] [N]	[N]	[N]	[]
RECOMMENDATIONS	: (If d:	ifferent	from NA	SA)	
[2 /1	R] [P]	[F]	[P]	[] ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	applicabl	e) ADEQUATE INADEQUATE	
REMARKS: THE IOA AGREES	WITH THE	NASA AN	ALYSIS.		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-208		NASA DATA BASELINE NEW]
MDAC ID:	EMU 208 FILTER AND ORIFIC	CE (ITEM 1	26)		
LEAD ANALYST:	G. RAFFAELLI				
ASSESSMENT:					
CRITICALI FLIGHT HDW/FUN			С	CIL	
·		_			
IOA [3 /1R] [P] [F] [P] P]	[X] *]
COMPARE [N /) [] [] [1	[]
RECOMMENDATIONS:	(If different f	rom NASA)			
[/] [] [] [] (AD	[D/DF] ELETE)
* CIL RETENTION R	ATIONALE: (If app	licable)			
REMARKS:			ADEQUATE ADEQUATE]
THE IOA AND THE NA CRITICALITY ASSIGN HARDWARE CRITICAL	NMENT. THE IOA N	L AGREEMEN OW CONCURS	NT EXCEPT S WITH THE	FOR NAS	HARDWARE A

ASSESSMEN ASSESSMEN NASA FMEA	I TI	D:	12/10/ EMU-20 126-FN	7	5							ASA DA BASELI N		[]	
SUBSYSTEM MDAC ID: ITEM:	М:		EMU 207 FILTER	₹ 2A	MI	ORI	FIC	CE	(ITEN	4 3	L26	5)					
LEAD ANA	LYST	Γ:	G. RAI	FA	ΕI	LLI											
ASSESSME	NT:																
(I	ricall FLIGHT			RI A	EDUND	ANG	CY B	SCRE	ENS	S C			CI		1	
	HI	OW/FUN	NC .		A			D			C						
NASA IOA	[2	2 /1R 2 /1R]	[P P]]	P P]	[P P]		[X X]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DAT:	ions:	(If	di	fí	feren	t:	fro	om NAS	SA))						
	[/]	[]	[] .	[]	(AI		'DI		ETE)
* CIL RE	TEN:	rion i	RATION	ALE	€:	(If	apj	pl:	icable		IA IAN	DEQUA' DEQUA'	re re	[]	
REMARKS:																	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-157		NASA DATA: BASELINE NEW	
MDAC ID:	EMU 157 PUMP INLET	FILTER (ITEM 1	.27)	
LEAD ANALYST:	G. RAFFAEL	LI		
ASSESSMENT:				
CRITICALI FLIGHT		DUNDANCY SCREEN	S	CIL ITEM
HDW/FUN	IC A	В	С	
NASA [2 /2 IOA [2 /1R] [P] [] [] [F] [] P]	[X] * [X]
COMPARE [/N] [N]] [N] [N]	[]
RECOMMENDATIONS:	(If diffe	erent from NASA)	
[2 /1R] [P]] [F] [[] D/DELETE)
* CIL RETENTION R	ATIONALE:	(If applicable)		
REMARKS:		I	ADEQUATE NADEQUATE	[]
FOR THE WORST CAS FUNCTIONAL CRITIC OF REDUNDANT COOL OF SCREEN B DUE T	ALITY SHOUI ING FUNCTIO	LD BE A "1R" WHI ONS. THE IOA A	EN COMBINED LSO RECOMME	WITH LOSS

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-156	5		NASA DATA: BASELINE NEW	
MDAC ID:	EMU 156 PUMP INI	LET FILT	ER (ITEM	127)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
		REDUNDA	NCY SCREE	ns	CIL ITEM
FLIGH HDW/FU	NC	A	В	С	
NASA [2 /2 IOA [2 /1R] [P]	[] [F]	[] [P]	[X] * [X]
COMPARE [/N] [N]	[и]	[и]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[2 /1R] [P]	[F]	[P] (A	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	pplicable	ADEQUATE	[]
REMARKS: THE IOA RECOMMEN	DS A CRI	TICALITY	OF 2/1R	WHEN LOSS O	F REDUNDANI

FUNCTIONS (SOP AND VENT LOOP COOLING) ARE ALSO CONSIDERED IN CONJUNCTION WITH THIS FAILURE MODE.

ASSESSMENT ASSESSMENT NASA FMEA	r id:	12/10/8 EMU-155 127-FM3	5			N	IASA DA BASELII NI] X]	
SUBSYSTEM: MDAC ID: ITEM:	-	EMU 155 PUMP IN	ILET	FILTER	(IT)	E M 127)			
LEAD ANALY	ST:	G. RAFF	'AELL	I						
ASSESSMENT	T:									
	FLIGHT			UNDANC'		REENS		CI II	L EM	
	HDW/FUN	IC	A	1	В	С				
] ASAN] AOI	2 /1R 2 /1R] [P] P]	[]	P]	[P]	[x] x]	*
COMPARE [/] []	[]	[]	[]	
RECOMMENDA	TIONS:	(If d	iffer	ent fr	com N	ASA)				
[/] []	[)	[[ADD/] DELF	ETE)
* CIL RETE	NTION R	ATIONAL	E: (I	f appl	icab		DEQUATE	ſ	1	
REMARKS: THE IOA AN	D THE N	ASA ARE	IN A	GREEME	NT.		DEQUATE		j	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-153 128-FM1	MU-153 BASELINI 28-FM1 NEV								
	EMU 153 CHECK VALVE A	ND HOUSING (ITEM 128)								
LEAD ANALYST:	G. RAFFAELLI									
ASSESSMENT:										
CRITICAL: FLIGH HDW/FU	\mathbf{T}	DANCY SCREENS B C	CIL ITEM							
NASA [2 /2 IOA [2 /2] []]	[] [] [P] [NA]	[X] * [X]							
COMPARE [/] [N]	[N] [N]	[]							
RECOMMENDATIONS:	(If differe	nt from NASA)								
[/] []	[] []	[] ADD/DELETE)							
* CIL RETENTION	RATIONALE: (If	applicable) ADEQUATE INADEQUATE								
REMARKS:										

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	NASA DATA BASELINE NEW		
MDAC ID:	EMU 154 CHECK VALVE AND HOUSING (ITEM 128)	
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICALI FLIGHT	CITTON DIRECT CONDEN	S	CIL ITEM
HDW/FUN	C A B	С	
NASA [2 /2 IOA [2 /1R] [P] [P] [P]	[X] * [X]
COMPARE [/N] [и] [и] [и]	[]
RECOMMENDATIONS:	(If different from NASA)	
[2 /1R] [P] [P] [[] D/DELETE)
* CIL RETENTION R	ATIONALE: (If applicable)		
	I	ADEQUATE NADEQUATE	[]
NASA ARE IN AGREEM CRITICALITY OF "11	N OF FUNCTIONAL CRITICALISMENT. THE IOA RECOMMENDS R" DUE TO POSSIBLE LOSS OF CTIONS (SOP AND PLSS VENT	TY, THE IOA A FUNCTION F LIFE RESU	AND THE AL LTING WHEN

ASSESSMEN ASSESSMEN NASA FMEA	T ID):	12/1 EMU- 128-	152	•								ATA: INE NEW	[
SUBSYSTEM MDAC ID: ITEM:	1:		EMU 152 CHEC	K VA	LV	E AN	ID I	IOU	SIN	G (ITE	EM 12	28)			
LEAD ANA	LYST:	:	G. R	AFF	EL	LI										
ASSESSME	T:															
•	CRITI	CAL			RE	DUNI	OAN	CY	SCR	EEN	S			CIL		
		/FU			A			В			С					
NASA IOA	[2	/1R /1R]	[P P]	[P P]]	P P]		[X]	*
COMPARE	[/]	[]	[3	[3		[]	
RECOMMEN	DATI	ons:	(3	[f d	if	fere	nt	fr	om N	IASA	.)					
	[/]	(]	[]	[]	(A	[DD/[) ELI	ETE)
* CIL RE	TENT	ION	RATI(DNAL	E:	(If	ap	pl	icak		Α		ATE ATE	_]	
REMARKS:					_				NT/TI							

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT ASSESSMENT NASA FMEA #	DATE: ID: :	12/10/8 EMU-100 131/162	86 0 2-F	M1						ASA DATA BASELINE NEW	. []	
SUBSYSTEM: MDAC ID:								'EM :	13	1)				
LEAD ANALYS	T:	G. RAFF	AE	LLI										
ASSESSMENT:														
CRI	FICALI FLIGHT	TY	R	EDUND	AN	CY	SCR	EENS	3		C	IL		
		IC.	A			В			С		I.	ΓEM	ſ	
NASA [2 IOA [2	2 /2 2 /1R] [P]	[F]]	P]	[X X]	*
COMPARE [/N] [N]	[N]	[N]	[]	
RECOMMENDATI	ons:	(If d	ifi	ferent	: f	rc	m NA	ASA)						
[2	2 /1R) [P]	[F]	Ε	P			'DE		TE)
* CIL RETENT	ON R	ATIONAL	E:	(If a	ιpp	li	cab]	le)						
REMARKS:								IN	AD	EQUATE EQUATE	_]	
THE NASA FME FAILURE - LO DID NOT CONS THEREFORE, D CRITICALITY.	IDER I ID NOI THE	COOLING THE SOP T FAIL I	AS TE	ND WA PROV IN AR VES T	TE ID RI HE	R IN VI	IN 1 GA NGA	HE TED	VE UN HE	DANT FUN FUNCTION	CT	AL:	SO N	, NASA AND,
REDUNDANCY A	ND TH	AT THE (CRI	TICAL	IT	Y	SHOU	LD 1	ΒE	2/1R.			_	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-103		BASELINE NEW	[x]
SUBSYSTEM: MDAC ID: ITEM:	EMU 103 PRIMARY H20	TANK 1 (ITEM 1	162)	
LEAD ANALYST:	G. RAFFAELL	Ι		
ASSESSMENT:				
CRITICAL	-	OUNDANCY SCREENS	5	CIL ITEM
FLIGH HDW/FU		В	С	
NASA [2 /2 IOA [2 /1R] [] .] [P]	[] [[F] [] P]	[X] * [X]
COMPARE [/N] [и]	[и] [N]	[]
RECOMMENDATIONS:	(If diffe	erent from NASA)	
[2 /1F	[P]	[F] [P] (AI	[] DD/DELETE)
* CIL RETENTION	RATIONALE:		ADEQUATE NADEQUATE	[]
REMARKS: THE NASA FMEA DI FAILURE - LOSS O	D NOT FULLY	EXTRAPOLATE TH	AEMI LOOP	. ALSO, NASA

DID NOT CONSIDER THE SOP AS PROVIDING A REDUNDANT FUNCTION AND,

THEREFORE, DID NOT FAIL IT IN ARRIVING AT THE FUNCTIONAL ADDITIONALLY, THE IOA AGREES WITH THE NASA SCREEN "B".

ASSESSM ASSESSM NASA FM	ENT	I	D:	E	2/10 MU-1 31/1	02		M2							ASA BASE] []	
SUBSYSTI MDAC ID ITEM:				EN 10 PF	02	RY	н	20	1AT	1K	1	(I	TEM	13	1)					
LEAD AND	ALY	ST	:	G.	RAI	FF	ΑE	LLI	-											
ASSESSMI	ENT	:																		
	CR		ICAL LIGH		?		R	EDU	INDA	N	CY	SC	REEN	s				IL PEM	Æ	
]	HDI	W/FU	NC			A				В			С					•	
NASA IOA	[2 2	/1R /1R]		[P P]]	P P]	[P P]]	x x]	*
COMPARE	[/]		[]		[]	[]		[]	
RECOMMEN	DA'	ric	ONS:		(If	di	ifi	fer	ent	f	ro	om 1	NASA)						
	[/]		[]		[]	[]	(A	[DD/	'DE] LE	TE)
* CIL RE	TEN	TI	ON F	TAS	IONA	LE	E :	(I:	f a	pp	li	.cak	ole)	ΑI	EQUA	TE	[1	
REMARKS: THE IOA	ANE	r (HE N	IAS.	A AR	E	IN	I A	GRE:	EM	EN	т.	I		EQUA		į]	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-105	FM2			SA DATA BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	EMU 105 PRIMARY H	H2O TAN	IK 1 (IT EM 162)		
LEAD ANALYST:	G. RAFFAI	ELLI					
ASSESSMENT:							
CRITICAL FLIGH		REDUNDA	ANCY S	CREENS		CIL	
HDW/FU	NC I	A	В	С			
NASA [2 /1R IOA [2 /1R	[]	P] P]	[P] [P]	[P [P]	[X [X] *]
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If di	fferent	t from	NASA)			
[/] [1	[]	[] (A	[DD/D] ELETE)
* CIL RETENTION	RATIONALE	: (If a	applic	Αľ	DEQUATE DEQUATE	[]
REMARKS: THE IOA AND THE	NASA ARE	IN AGRI	EEMENT	•			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-101 131/162-E	FM3			SA DATA ASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EMU 101 PRIMARY H	H2O TAN	K 1 (ITEM 131)		
LEAD ANALYST:	G. RAFFAE	ELLI					
ASSESSMENT:							
CRITICAL FLIGH	r	REDUNDA				CIL	
HDW/FU	NC A	Ą	В	С			
NASA [2 /1R IOA [2 /1R] [F	?]	[P] [P]	[P [P]]	[X] *]
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If dif	ferent	from	NASA)			
[/] []	[]	ξ :		[[D/D] ELETE)
* CIL RETENTION PREMARKS:				ADI INADI	EQUATE EQUATE	[]
THE IOA AND THE I	NASA ARE I	N AGRE	EMENT.				

ASSESSMENT ASSESSMENT NASA FMEA	r ID	:	EMU-10	4		13						DATA: ELINE NEW	[
SUBSYSTEM: MDAC ID: ITEM:	:		EMU 104 PRIMAF	ξ¥	Н2	O TAM	1K	1	(ITEM	: 1	.62)				
LEAD ANAL	YST:		G. RAI	F	ÆI	LI									
ASSESSMENT	r:														
CI			TY.		RE	DUND	ANC	CY	SCREE	NS	5		CII		
		IGHT /FUI	1C		A			В			С				
NASA IOA	[2 [2	/1R /1R]	[P P]	[P P]]	P] P]		[}	[]	*
COMPARE	[/]	[]	[]	[]	,	[]	
RECOMMEND	ATIC	ns:	(If	đ	ifi	feren	t :	fro	om NAS	SA)					
	[/]	[]	[]	[]	(A	[DD/I		ETE)
* CIL RET	ENT	ON :	RATION	AL	E:	(If	apj	p1 :	icable	≥) Il	ADEQ VADEQ	UATE UATE	[]	
REMARKS: THE IOA A	ND T	THE :	NASA A	RE	I	N AGR	EE	ME	NT.						

ASSESSI ASSESSI NASA FI	1ENT	ID:	8/06/ EMU-7 131/1	19	X	M4						ASA D BASEI		[]	
SUBSYST MDAC II ITEM:			EMU 719 PRIMA	RY	W	ATER	TAI	ΝK	ASS	ЕМВ	LY	(ITE	M 1	31,	/1	62)
LEAD AN	IALYS'	т:	G. RA	FF	AE]	LLI											
ASSESSM	ENT:																
	CRI	TICAL: FLIGH:	TTY T		RI	EDUNI	OANC	CY	SCR	EEN	S				IL CEN	Л	
	HI	DW/FUI	1C		A			В			С					•	
NASA IOA	[]	3 /1R 3 /1R]	[P P]]	F F]	[P P]]	X X]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMME	NDATI	cons:	(If	di	ff	eren	it f	rc	om NA	ASA)	l						
	[/]	[]	[]	[]	(AI	[)D/	'DE] LE	TE)
* CIL R		CION F	RATIONA	LE	:	(If	app	li	.cab]			EQUAT	re re	[]	
REMARKS THE IOA		THE N	ASA AR	Œ	IN	AGR	EEM	ΈN	T.					_		-	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-718X 131/162-1			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 718 PRIMARY I	H2O TANK	ASSEMBLY	(ITEM 131/	/ 162)
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAL		REDUNDANG	CY SCREENS	3	CIL ITEM
FLIGH HDW/FU		A	В	С	IIIM
NASA [2 /1R IOA [3 /1R		P] [P] [F] [F] [P] P]	[X] * [X]
COMPARE [N /] [] [] [1	[]
RECOMMENDATIONS:	(If di	fferent :	from NASA)		
[3 /1F	2][] [] [] (AI	[] OD/DELETE)
* CIL RETENTION	RATIONALE	: (If ap		ADEQUATE NADEQUATE	•
REMARKS: THE IOA IS IN AG	REEMENT W	ITH THE	NASA EXCE	PT FOR HARI	DWARE

CRITICALITY. THE IOA RECOMMENDS A "3/1R" BECAUSE A MINIMUM OF 3 REDUNDANT ITEM FAILURES MUST OCCUR TO RESULT IN LOSS OF LIFE.

ASSESSME ASSESSME NASA FME	TN	I	D:	EMU-	720	X	M6							DA' ELI N	NE]	
SUBSYSTE MDAC ID:				EMU 720 PRIM	ARY	W	ATER	TAN	K	ASS	SEMB	LY	(I	TEM	13	1/1	L6:	2)	
LEAD ANA	LY:	ST	:	G. R	AFF	AE	LLI												
ASSESSME	NT	:																	
		F	LIGH			RI	EDUN	DANC	Y	SCF	REEN	S				CII			
	I	HD	/FU	NC		A			В			С							
NASA IOA	[2 2	/1R /1R]	[[P P]	[[P P]	[P F]			X]	:] :])]	*
COMPARE	[/]	[]	[]	[N]			[]	l	
RECOMMEN	DAT	ric	ons:	(I:	f di	ff	fere	nt f	r	om N	(ASA)							
	[/]	[]	[]	[]	(AD	[D/D	EI	LE'	TE)
* CIL RE	TEN	T]	ON :	RATIO	NALE	: :	(If	app.	l j	cab	le)								
REMARKS:											II	AI IAI)EQI	JATE JATE	;	[]		
THE IOA FURTHER	ANI REV) I	HE I	NASA A AGREES	ARE S WI	IN TH	GEN PAS	NERA:	L E	AGR OF	EEMI SCRI	ENT EEN	I C	THE	: I	OA,	U	P	ИС

ASSESSME ASSESSME NASA FME	NT I	D:	EMU-	284										DATA ELINE NEW	[x]		
SUBSYSTE MDAC ID: ITEM:	м:		EMU 284 FDW	SUPI	, L	y PR	RESS	URI	E \$	SENS	OI	?− 0	02 (SIDE	(II)	rem	I 1	32A	۲)
LEAD ANA	LYSI	:	G. F	RAFF	ÆΙ	LLI													
ASSESSME	NT:																		
	F	CICAL	Т			EDUN	IDAN	CY B	S	CREE	ENS	s c				CL CEM			
	HL	W/FU	NC		A			Б				C							
NASA IOA	[2	2 /2 3 /2R]	[[P]]]	P]		[P]		[X]	*	
COMPARE	[]	1 /N]	[N]	[N]		[N]		[N]		
RECOMMEN	DATI	ons:	()	(f d:	Ĺfí	fere	ent	fr	om	NAS	SA))							
	[3	3 /2R]	[P]	(P]		[P]	(A		D DI] ELE	TE)	
* CIL RE	TENT	CION	RATIO	ONALI	Ξ:	(If	ap	pl	ic	able	-			UATE UATE	[]		
REMARKS: THE IOA	DOF	י אוריתי	CONT	ישרדי	, כ	דעיו	STN	CT.	FC 1	FATI	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	RE.	A	MTSST	ON	TN	(PA	СТ	
UNLESS R	EDUN	IDANC	Y IS	ALS)]	LOSI		TH	E :	IOA	TI	HEI	REF	ORE R	EC	MC	1EN	DS	A

3/2R CRITICALITY.

ASSESSME ASSESSME NASA FME	NT	I	D:	12 EN 13	MU-285 BASELINE 32A-FM2, FM3 NEW MU											[; ;	
SUBSYSTE MDAC ID: ITEM:	М:			EN 28	I U 85							SENS	OR-	-02 S	SIDE	(ITE	e m	132A)
LEAD ANA	LY:	ST	:	G.	RAI	FF	AE)	LLI										
ASSESSME	NT	:																
CRITICALITY REDUNDANCY SCREENS FLIGHT HDW/FUNC A B C												CII						
]	HD	W/FUI	NC			Α			В				3				
NASA IOA	[2	/2 /2R]]	P]		P]		[[F	·]		[X	;]]	*
COMPARE	[N	/N]		[N]		N]		[N	[]		[]	[]	
RECOMMEN	DA:	ri	ons:		(If	d:	ifi	fere	ent	fr	om	NAS	A)					
	[/)		[]	١	•]		[]	(A)	[DD/E	ELI	ETE)
* CIL RE										_			A		ATE ATE	_]	
THE IOA	AGI	ΚĽΙ	ES W.	L'I'H	THE	: 1	SAN	SA I	INI)IN	GS.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:			1	NASA DATA: BASELINE NEW	
MDAC ID:	EMU 286 FDW SUPPL	Y PRESSUR	E SENSOR	-02 SIDE ((ITEM 132A)
LEAD ANALYST:	G. RAFFAE	LLI			
ASSESSMENT:					
CRITICALI FLIGHT HDW/FUN		REDUNDANCY L E		С	CIL ITEM
NASA [2 /1R IOA [2 /1R] [P) [F	[P] P]	[X] *
COMPARE [/] [] []] [1	[]
RECOMMENDATIONS:	(If dif	ferent fr	om NASA)		
[/	} [] [] [] (AI	[] OD/DELETE)
* CIL RETENTION 1	RATIONALE:	(If appl		ADEQUATE ADEQUATE	-
REMARKS: THE IOA AGREES WI IOA AND THE NASA ANALYSIS.	ITH THE NA ARE IN AG	AA SCREEN GREEMENT (B AND DE	FINED EFFI	ECTS. THE F THE

ASSESSME ASSESSME NASA FME	ENT I	D:	EMU-2	83						1		SA DATA BASELINE NEW	[]	
SUBSYSTE MDAC ID:			EMU 283 FDW S	UPP:	LY	PRES	ssi	UR]	E SEN	SOR	-0	2 SIDE	(I!	re1	4 1	32A)
LEAD ANA	LYST	:	G. RA	FFA	ΕL	LI										
ASSESSME	NT:															
	F	LIGH'				DUNDA	M							IL PEM	1	
		•	NC	7	_			В		•	C					
NASA IOA	[2 [2	/1R /1R]	[]	P P]	[P F]	[]	P P]	[X X] :	*
COMPARE	Į.	/]	[]	[N]	[]	[]	
RECOMMEN	DATI	ons:	(If	dii	ff	erent	: 1	fro	om NA	SA)						
	[/]	[)	[]	['DE] :LET	ΓE)
* CIL RE	TENT:	ION I	NOITAS	LE:	:	(If a	pp	oli	cabl	e)						
REMARKS:										. 7	AD:	EQUATE EQUATE	[]	
EXCEPT FOR NOW	OR SO	CREEN ES WI	B, TH	IE I	(O)	A AND A SCR	T EE	CHE EN	NAS	A AF	RΕ	IN AGR	EEM	ΙEΝ	T.	THE

NASA DATA: ASSESSMENT DATE: 12/10/86 BASELINE [ASSESSMENT ID: EMU-109 NEW [X] NASA FMEA #: 132B-FM1 SUBSYSTEM: EMU 109 MDAC ID: FDW SUPPLY PRESSURE SENSOR (ITEM 132B) ITEM: LEAD ANALYST: G. RAFFAELLI **ASSESSMENT:** CRITICALITY REDUNDANCY SCREENS CIL ITEM FLIGHT HDW/FUNC A B С NASA [2/2] [] [] [X]
IOA [3/2R] [P] [F] [X] COMPARE [N/N] [N] [N] [N]RECOMMENDATIONS: (If different from NASA) [3/2R] [P] [F] [P] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [INADEQUATE [

REMARKS:

THE SENSOR FAILURE (BIASED OR FAILED HIGH) WILL HAVE NO IMMEDIATE IMPACT TO THE CREWMEMBER, EMU, OR MISSION. THE IOA RECOGNIZES THAT THE LOSS OF THIS SENSOR WILL NOT PERMIT THE CREWPERSON TO DETECT RESERVE WATER SUPPLY USEAGE, HOWEVER THE EMU IS NOMINALLY SUPPLIED SUFFICIENT WATER FOR A STANDARD DURATION EVA AND THE ELAPSED LINE DURATION IS AVAILABLE TO THE CREWPERSON. DOWNSTREAM PRESSURE TO THE SUBLIMATOR IS ALSO MONITORED TO ENSURE ACCEPTABLE SUPPLY PRESSURE. THE ADDITIONAL FAILURES OF TIME AND DOWNSTREAM PRESSURES WILL RESULT IN MISSION TERMINATION. IOA ALSO RECOMMENDS SCREEN B BE FAILED DUE TO A POSSIBLE FAILURE OF THE SENSOR AT ITS NOMINAL VALUE JUST PRIOR TO RESERVE TANK (NOTE: NASA HAS AN ADDITIONAL CRITIALITY OF 3/1Rb ASSIGNED THIS FAILURE).

ASSESSMEN ASSESSMEN NASA FMEA	T I	D:		10 FM	6 2,	FM3]	NASA I BASEI		[]]	
SUBSYSTEM MDAC ID: ITEM:			EMU 110 FDW S							NSOR	(ITEM	1 13	2B)			
LEAD ANAL	YST	·:	G. RA	FF.	AE:	LLI										
ASSESSMEN	T:															
C	F	LIGH			R	EDUND	AN	CY	SCRI	EENS			CI			
	HD	W/FUI	NC		A			В		C	:					
NASA IOA	[2 [3	/2 /2R]	[P]	[F]	[[F	,]		[]	х ј х ј	*	
COMPARE	[И	/N]	[N]	[N]	[N]		[]		
RECOMMENDA	ATI	ons:	(If	di	Ĺff	eren	t 1	fro	m NA	SA)						
1	[/]	[]	[]	[1	(AI	[DD/I) DEL	ETE)	
* CIL RETE	ENT:	ION F	RATION	ALE	::	(If	app	oli	cabl	e)						
REMARKS:											DEQUA:		[]		
A BIASED I AND PREVEN	THE E IS	CREW IND	EWMEME PERSON ICATIV	BER I W	F OU	'ROM I 'LD Al	DET LSC	EC B	TING E RE	ACT OUTR	UAL RI	ESER JUD	VE GE	TO	ጥልክፑ	

THEREFORE AGREES WITH THE NASA.

ASSESSMEN ASSESSMEN NASA FME	I TV	D:	EM	/10/8 U-112 2B-FN	2								SA DATA BASELINE NEW	[]	
SUBSYSTEM MDAC ID:	м:		EM 11 FC	.2	PPI	TA 1	PRESSI	JRE	E S	ENS:	OR	۱ (ITEM 13	2B)		
LEAD ANA	LYSI	? :	G.	RAFI	FAI	ELL	I										
ASSESSME	NT:																
		CICAL		?]	REDI	UNDAN	CY	sc	REE	NS	;			IL TEN	4	
	_	W/FU			i	A		В				С					
NASA IOA	[2	2 /1R 2 /1R]		[]	P]	[F P]		[P F]	[X X]	*
COMPARE	[/]		[)	Į	N]		[N]	[]	
RECOMMEN	DAT	cons:		(If	di	ffe	rent	fro	om	NAS	A))					
	[/]		[]	(]		[] (2		/D		ETE)
* CIL RE	TEN	rion	RA:	TIONA	LE	: (If ap	pl	ica	ble			DEQUATE DEQUATE]	
REMARKS: THE IOA	AGR	EES W	ITI	н тне	N	ASA	CRIT	IC.	ALI	ΥT	Αì	ΝD	SCREEN	AS	SI	GNI	MENTS.

ASSESSMI ASSESSMI NASA FMI	ENT	I	ATE: D:	El	2/10, MU-1: 32B-1	11]		A DA SELI N		[]	
SUBSYSTE MDAC ID:				EN 13 FI	L1	JP:	PL	Y F	RES	st	JR.	E S	SENSC	DR	(I!	гем	132	: B])		
LEAD ANA	LY	ST	:	G.	RAI	F	AE:	LLI													
ASSESSME	ENT	:																			
	CR.	IT:	ICAL LIGH	ITY T	?		R	EDU	NDA	NC	Y	so	CREEN	ıs					IL Pen	vr	
]	HD	W/FU	NC			A				В			(3					•	
NASA IOA	[2	/1R /1R]]	P P]]	P P]	[I	?] ?]]	X X]	*
COMPARE	[/]		[]		[]	[)			[]	
RECOMMEN	DA:	ric	ons:		(If	di	ifi	fer	ent	f	rc	om	NASA	.)							
	[/]		[]		[]	[]	•	(AD	[D/	'DE] ELF	TE)
* CIL RE REMARKS: THE IOA													Ţ			UATI UATI		[]	
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-163	=	ASELINE [] NEW [X]
MDAC ID:	EMU 163 CONDENSATE H20	O RELIEF	(ITEM 134)
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
FLIGHT	r	DANCY SCREENS	CIL ITEM
HDW/FUI		ВС	
NASA [3 /1R IOA [3 /2R] [P]] [P]	[NA] [P [F] [P] [X] *] [X]
COMPARE [/N] []	[и]] []
RECOMMENDATIONS:	(If differe	nt from NASA)	
1] []	[F] [[] (ADD/DELETE)
* CIL RETENTION I	RATIONALE: (If		EQUATE []
REMARKS: THE IOA AND THE I ASSIGNMENTS ARE I FUNCTIONAL CRITIC CRIDIBLE AND THEI BECAUSE THE	IN AGREEMENT. CALITY, THE IO	UPON FURTHER R A HAS FOUND THE	EVIEW OF THE NASA SCRENARIO

FAILURE OF SCREEN B.

ITEM NORMALLY FUNCTIONS WITHIN THE MISSION, THE IOA RECOMMENDS

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-164		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:		E H2O RELIEF V	ALVE (ITEM 13	34)
LEAD ANALYST:	G. RAFFAEI	LLI		
ASSESSMENT:				
FLIGHT	r	EDUNDANCY SCRE		CIL ITEM
HDW/FU	IC A	В	С	
NASA [2 /1R IOA [2 /1R] [P] [P] [P]] [F]	[P] [F]	[X] * [X]
COMPARE [/] [] [N]	[N]	[]
RECOMMENDATIONS:	(If difi	ferent from NA	SA)	
\]] [] [F]		[] DD/DELETE)
* CIL RETENTION H	RATIONALE:	(If applicable	e) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AND THE METHE IOA RECOMMENI READILY DETECTABLE	S FAILED.		CEPT ON SCREE	EN B WHICH

ASSESSMENT NASA FMEA	ID:	12/10/86 EMU-165 134-FM2			BASELI	TA: TNE [] TEW [X]
SUBSYSTEM: MDAC ID: ITEM:		EMU 165 CONDENSAT	E H2O R	ELIEF V <i>F</i>	ALVE (ITEM	1 134)
LEAD ANALY	ST:	G. RAFFAE	LLI			
ASSESSMENT	:					
CF	RITICALI FLIGHT	י		CY SCREE	ens C	CIL ITEM
	HDW/FUN	IC A		Б	C	
NASA [IOA [2 /1R 2 /1R] [P] [P] F]	[P] [F]	[X] * [X]
COMPARE [. /] [] [n j	[N]	[]
RECOMMENDA	ATIONS:	(If dif	ferent	from NAS	SA)	
Į	. /] [] [F]	[]	[] (ADD/DELETE)
* CIL RETE	ENTION I	RATIONALE:	(If ap	plicable	e) ADEQUAT INADEQUAT	

REMARKS:

THE IOA AND THE NASA ARE IN AGREEMENT REGARDING CRITICALITY AND SCREEN A. THE IOA AGREES WITH THE NASA SCREEN C ASSIGNMENT; HOWEVER, THE IOA RECOMMENDS FAILURE OF SCREEN B BECAUSE WATER CARRYOVER IS AN UNDESIRABLE EFFECT AND SHOULD NOT BE CONSIDERED A DETECTION METHOD.

ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-162 NASA FMEA #: 134-FM3															ASA DA BASELI 1		[]			
SUBSYSTE MDAC ID:					EN 16 CC	52	NS.	AT]	Е Н2	20	RE	L	ŒF	VA	LV	Æ	(ITEN	11	34)		
LEAD ANA	LYS	ST	:		G.	RA:	FF.	AE:	LLI													
ASSESSME	NT:	:																				
		F	LIC	ALI GHI FUN	C	ľ		RI A	EDUN	IDA:		Y B	SC	REE	ns	C				IL PEN	1	
NASA IOA	[2	/1	lR lR]		[P P]		[P P]		[[P P]		[X X]	*
COMPARE	[/]		[}		[]		[]		[]	
RECOMMEN	[AD	PIC	ONS	3:		(If	d:	if	fere	nt	f	rc	m l	NAS.	A)							
	[/]		[]		[]		[]	(Al		/DE] ELI	ETE]
* CIL RE	TEN	VT)	IOI	1 F	ГAЯ	ION	ALI	Ξ:	(If	a]	gp.	li	.cal		-		EQUAT EQUAT		[]	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSME ASSESSME NASA FME	TN	II		EM	/10/ U-12 5-FM	23	5							ASA BASE	LII		[]	
SUBSYSTE MDAC ID:				EM 12 FE	3	ΥT	ER	RELI	Œ	' V	ALVE	(I	ΤE	M 13	35)					
LEAD ANA	LYS	ST:	:	G.	RAI	F	AEI	LLI												
ASSESSME	ENT:	:																		
	CRI		ICAL LIGH				RI	EDUNI	A C	ICY	SCRE	EEN						[L [E]	1	
	ŀ	IDI	W/FU	NC			A			В			С							
NASA IOA	[[2	/1R /1R]]	P P]	[P P]	[P P]			[X X]	*
COMPARE	C		/]		[]	(•]	[]			[]	
RECOMMEN	VDA:	ri	ons:		(If	đ:	if	ferer	nt	fr	om NA	ASA	.)							
	[/]		[]	1	-]	[]		(A)	[DD,	/ D]	ETI]	ETE)
* CIL RI	ETEI	NT:	ION	RAT	ION	AL	E:	(If	ar	pl	icab]		A	DEQU DEQU			[]	
REMARKS	:											•					·		J	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-125		NASA DATA: BASELINE [] NEW [X]									
	EMU 125 FEEDWAT	ER RELI	EF VALVE	(ITEM 135)								
LEAD ANALYST:	G. RAFF	AELLI										
ASSESSMENT:												
CRITICALI FLIGHT		REDUND	ANCY SCRE	ens	CIL ITEM							
HDW/FU	1C	A	В	С								
NASA [3 /2R IOA [2 /2] [P] P]	[NA] [F]	[P] [P]	[X] * [X]							
COMPARE [N /N] []	[N]	[]	[]							
RECOMMENDATIONS:	(If d	ifferen	t from NAS	SA)								
[/] []	[]	[] (A)	[DD/DELETE)							
* CIL RETENTION F	RATIONALI	E: (If a	applicable	e) ADEQUATE	[]							
REMARKS:					[]							
THE IOA AGREES WI RECOMMEND MODIFIC REGULATION AS A F	CATION OF	FEFFECT	S TO INDI	ALSO THE IOA CCATE SCU PRI	WOULD ESSURE							

ASSESSMEN ASSESSMEN NASA FMEN	T	ID		EM	/10/ U-12 5-FM	4								ASA DA BASELI N		_]		
SUBSYSTEM MDAC ID: ITEM:	1:			EM 12 FE	4	TE	R	RELII	EF	VA	LVE	(I	TEI	M 135)						
LEAD ANA	LYS	T:	:	G.	RAF	FA	EI	LI												
ASSESSME	NT:	;																		
(CRI		CAL LIGH				RE	DUND	ANC	CY	SCRE	EN				CI	L EM]		
	F	łDV	/FU	NC			A			В			С							
NASA IOA]	3 2	/1F	1]]	P P]	[F P]	[P P]		[X X]	*	
COMPARE			/							N		[]		[]		
RECOMMEN	DA'	ΓI	ONS:		(If	đ:	if	feren	t:	fr	om NA	SA	۲)							
	[/]		[]	[N	A.]	(]	(A)		/DI		TE)	
* CIL RE	TE	NT:	ION	RAT	TION	ΑL	E:	(If	ap;	pl.	icabl		A	DEQUA'		[]		
REMARKS:											_					- T		-		

THE IOA AND THE NASA ARE IN AGREEMENT EXCEPT FOR HARDWARE CRITICALITY AND SCREEN B. DUE TO THE DUAL O-RINGS THE IOA AGREES WITH THE NASA CRITICALITY BUT RECOMMENDS PASSAGE OF SCREEN B BE "NA". (THIS HAS BEEN AGREED TO BY THE NASA SSM).

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-121	121 BASELINE C 1									
MDAC ID:		SURE REGULATOR (ITE	M 136)								
LEAD ANALYST:	G. RAFFAELLI										
ASSESSMENT:											
CRITICALI FLIGHT HDW/FUN		ANCY SCREENS B C	CIL ITEM								
			_								
IOA [2 /1R] []] [P]	[P] [P]	[] * [X]								
COMPARE [N /N] [N]	[N] [N]	[N]								
RECOMMENDATIONS:	(If different	from NASA)									
[2 /1R] [P]		[A] (ADD/DELETE)								
* CIL RETENTION R	ATIONALE: (If a	pplicable) ADEQUATE	? ()								
REMARKS:		INADEQUATE									
AN INTERNAL LEAKA PRESSURE TO THE ST COOLING, THEREBY	UBLIMATOR AND R CAUSING MISSION ERE COULD BE LO	ROVIDE WATER AT AN ESULT IN BREAKTHROUTERMINATION. ADDINGS OF LIFE. THE ICTY OF 2/1R.	IGH AND LOSS OF								

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-119 136-FM2		NASA DATA: BASELINE NEW	[x]
SUBSYSTEM: MDAC ID: ITEM:	EMU 119 FEEDWATER F	PRESSURE REGULA	TOR (ITEM 1	36)
LEAD ANALYST:	G. RAFFAELI	ŢĪ		
ASSESSMENT:				
CRITICAL: FLIGHT HDW/FUI	r	DUNDANCY SCREEN B	s C	CIL
NASA [2 /1R IOA [2 /1R] [P]	[P] [] [P] [P] P]	[X] *
COMPARE [/	j [:] [] [3	[]
RECOMMENDATIONS:	(If diffe	erent from NASA	')	
[/] [] [][[] (AI	[] OD/DELETE)
* CIL RETENTION :	RATIONALE:		ADEQUATE NADEQUATE	[]

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-120 136-FM3	NASA DATA: BASELINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	EMU 120 FEEDWATER PRESSURE R	REGULATOR (ITEM 136)
LEAD ANALYST:	G. RAFFAELLI	
ASSESSMENT:		
CRITICALI FLIGHT	TY REDUNDANCY S	SCREENS CIL ITEM
HDW/FUN	IC A B	C
NASA [2 /1R IOA [2 /1R] [P] [P]	[P] [X]*
COMPARE [/] [] []	[] []
RECOMMENDATIONS:	(If different from	NASA)
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REMARKS:	ATIONALE: (If application of the state of th	ADEQUATE [] INADEQUATE []

EMU-122	BASELINE []								
122	ER PRES	SURE	REGUL	ATOR (ITEM :	136)				
LEAD ANALYST: G. RAFFAELLI									
	REDUND	ANCY	SCREE	NS	CIL ITEM				
	A	В		С					
[]	P] P]	[P]	[P] [P]	[X] *				
] []	[1	[]	[]				
(If d	ifferen	t fro	om NAS	A)					
) []	[]	[] (A)	[] DD/DELETE)				
RATIONAL	E: (If	appli		ADEQUATE	[]				
	EMU-122 136-FM4 EMU 122 FEEDWAT G. RAFF LITY HT UNC R] [] [] [] [] [EMU 122 FEEDWATER PRES G. RAFFAELLI LITY REDUND HT UNC A R] [P] R] [P]] [] (If different	EMU-122 136-FM4 EMU 122 FEEDWATER PRESSURE G. RAFFAELLI LITY REDUNDANCY IT UNC A B R] [P] [P R] [P] [P] [] [(If different from the second	EMU-122 136-FM4 EMU 122 FEEDWATER PRESSURE REGUL G. RAFFAELLI LITY REDUNDANCY SCREEN IT UNC A B R] [P] [P] R] [P] J [P] J [P] RATIONALE: (If applicable	EMU-122 136-FM4 EMU 122 FEEDWATER PRESSURE REGULATOR (ITEM G. RAFFAELLI LITY REDUNDANCY SCREENS HT UNC A B C R] [P] [P] [P] R] [P] [P] C [P] [P] [P] C [P] [P] C [P] [P] [P] C [P] [P] [P] C [P] [P] C [P] [P] C [P] [P] C [P] [P] C [P] [P] C [P] [P] C [P] [P] C [P] [P] C [P] C [P] [P] C				

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-128 NASA FMEA #: 137-FM1															DAT SELIN	1E		x]	
SUBSYSTE MDAC ID: ITEM:	M:			EM 12 FE	8	AT I	ER	SHU	TO:	FF '	VAL	/E (IT]	EM	137))				
LEAD ANA	LYS	T:		G.	RA	FF	AE	LLI												
ASSESSME	NT:	:																		
	CRI		CAL IGH		•		RI	EDUN	[DA]	NCY	SCF	REEN	s				CI	L EN		
	H	IDW	/FU	NC			A			В			С							
NASA IOA	[2	/1R /1R]]	P P]		[P [P]	[P P]			[X X]	*
COMPARE	[/]		[]		[]	[]			[]	
RECOMMEN	DAT	OI	ns:		(If	đ:	ifi	fere	nt	fr	om N	IASA)							
	[/]		[]	!	[]	[]	((AI	[)D/	'DI] ELF	ETE)
* CIL RE	TEN	TI	ON 1	RAT	'ION <i>I</i>	λLJ	Ε:	(If	aj	pp1:	icak	•			UATE UATE	E E	[]	
REMARKS: THE IOA	AND	т	HE I	NAS	A AI	RΕ	Iì	I AG	REI	EMEI	NT.						-		-	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-129		ATA: INE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	EMU 129 FEEDWATER SH	UTOFF VALVE (ITEM 13	7)
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICAL FLIGH		NDANCY SCREENS	CIL ITEM
_	NC A	в с	
NASA [2 /2 IOA [2 /2] []]	[] [] [P] [P]	[X] * [X]
COMPARE [/] [N]	[и] [и]	[]
RECOMMENDATIONS:	(If differ	ent from NASA)	
[/] []	[] []	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE: (I	If applicable) ADEQUA INADEQUA	TE []
REMARKS: THE IOA AND THE DISAGREES WITH T	NASA ARE IN A	AGREEMENT. HOWEVER, ASSIGNMENT OF 2/2 IN	THE IOA THAT THE VALVE

IS NOT NOMINALLY CLOSED DURING EVA.

12/10/86 EMU-131 137-FM3			NASA DATA BASELINE NEW						
EMU 131 FEEDWATER	R SHUTO	FF VALVE	(ITEM 137)						
LEAD ANALYST: G. RAFFAELLI									
T				CIL ITEM					
		_	-	<i>r</i>					
] [P	,]	[F]	[P]	[X] * [X]					
] [N]	[и]	[N]	[]					
(If dif	ferent	from NA	SA)						
] [] ([]		[] DD/DELETE)					
			∍) ADEQUATE INADEQUATE	[]					
	EMU-131 137-FM3 EMU 131 FEEDWATEF G. RAFFAE ITY F T NC A] [F] [N (If dif] [RATIONALE:	EMU-131 137-FM3 EMU 131 FEEDWATER SHUTO G. RAFFAELLI ITY REDUNDANT NC A] []] [P]] [N] (If different] [] RATIONALE: (If approximation of the property of the p	EMU-131 137-FM3 EMU 131 FEEDWATER SHUTOFF VALVE G. RAFFAELLI ITY REDUNDANCY SCRE T NC A B [EMU-131 137-FM3 EMU 131 FEEDWATER SHUTOFF VALVE (ITEM 137) G. RAFFAELLI ITY REDUNDANCY SCREENS T NC A B C] [] [] [] []] [P] [F] [P]] [N] [N] [N] (If different from NASA)] [] [] [] (ARATIONALE: (If applicable) ADEQUATE INADEQUATE					

	12/10/86 EMU-126 137-FM4		NASA DA BASELI N	
	EMU 126 FEEDWATER	SHUTOFF V	ALVE (ITEM 137)
LEAD ANALYST:	G. RAFFAE	LLI		
ASSESSMENT:				
CRITICAL FLIGH HDW/FU	T	EDUNDANCY :	screens C	CIL ITEM
NASA [2 /2 IOA [2 /2] [P] [] [P] []] [P]	[X] * [X]
COMPARE [/] [N] [N] [N]	[]
RECOMMENDATIONS:	(If dif	ferent from	m NASA)	
[/] [.] [] []	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE:	(If appli	cable) ADEQUAT INADEQUAT	
REMARKS:				

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-127 137-FM5	MU-127 BASELINE []											
	EMU 127 FEEDWATER	SHUTOFF VALVE	(ITEM 137)										
LEAD ANALYST:	G. RAFFAEI	LI											
ASSESSMENT:													
CRITICAL: FLIGHT HDW/FUN	ŗ	DUNDANCY SCREE	ns C	CIL ITEM									
•		_	C										
NASA [2 /1R IOA [2 /1R] [P] [P]] [F]	[P] [P]	[X] * [X]									
COMPARE [/] [] [N]	[]	[]									
RECOMMENDATIONS:	(If diff	erent from NAS	A)										
[/] [] []	[] IA)	[] DD/DELETE)									
* CIL RETENTION F	RATIONALE:	(If applicable) ADEQUATE	r 1									
REMARKS:			INADEQUATE										
THE IOA AND THE N REGARDING WHICH T	ASA ARE IN THE IOA AGR	AGREEMENT EXC EES WITH THE N	EPT FOR SCRI	EEN B									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-130 137-FM6	j		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 130 FEEDWATE	R SHUTOFF	VALVE	(ITEM 137)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAL FLIGH	r	REDUNDANC			CIL ITEM
HDW/FU	NC	A	В	С	
NASA [2 /2 IOA [2 /1R] [P] [] F]	[] [P]	[X] *
COMPARE [/N] [N] [и]	[и]	[]
RECOMMENDATIONS:	(If di	fferent f	rom NAS	A)	
[2 /1R] [P] [P]	[P]	[DD/DELETE)
* CIL RETENTION	RATIONALE	E: (If app) ADEQUATE INADEQUATE	[]
REMARKS:					

A FAILURE SUCH AS THIS (AN ELECTRICAL SHORT) CAN RESULT IN THE VALVE FAILING CLOSED OR USE OF AVAILABLE BATTERY POWER DURING EVA; EITHER OF WHICH, IF COMBINED WITH AN SOP FAILURE, CAN RESULT IN LOSS OF LIFE. THEREFORE, A 2/1R CRITICALITY IS RECOMMENDED. THE IOA ALSO NOW RECOMMENDS PASSAGE OF ALL SCREENS.

ASSESSME ASSESSME NASA FME	ENT	II		EM	2/10, MU-1: 88-F	32											DA ELI N		[x]	
SUBSYSTE MDAC ID:				EM 13 FE		AT:	ER	PR	ESS	UF	RE	SE	ENSC	R	(:	(TE	м 1	.38)			
LEAD ANA	LYS	T:		G.	RA	FF.	AE:	LLI														
ASSESSME	NT:																					
		FI	CAI LIGH I/FU	T			RI A		NDA	NC	EY B	sc	REE	:NS	s c					IL PEN	1	
NASA IOA	[2	/2 /3]		[P]]	P]		[P]			[X]	*
COMPARE	[N	/N]		[N]		[N]		[N]			[N]	
RECOMMEN	DAT	'IC	ns:		(If	d:	ifi	fere	ent	f	rc	m	NAS	A)	ı							
	[/]		[]		[]		[]		(AI	[OD/	/DF] ELF	ETE)
* CIL RE	TEN	TI	ON	RAT	'ION <i>I</i>	ALI	Ξ:	(II	f a	pp	1 i	.ca		-			JAT JAT		[]	

THE IOA AGREES WITH THE NASA ANALYSIS.

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SUBSYSTEM MDAC ID: ITEM:	M:			EM 13 FE	3	TI	ER	PRES	sst	JRE	s	ENSC	R	()	TEM	I 1:	38)	ı			
LEAD ANA	LYS	T:	:	G.	RAF	FA	AEI	LLI													
ASSESSME	NT:																				
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NASA IOA	[2	/2 /3]		[P]		[[P]		[P]			[X]	*
COMPARE	[N	/N]		[N]		[N]		[N]			[N]	
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* CIL RE	TEN	T.	ION	RAT	'ION	AL l	E:	(If	a	ppl	ic	able		A A	DEQU DEQU	JAT JAT	E E	[]	
REMARKS:																					

THE IOA AGREES WITH THE NASA ANALYSIS.

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SUBSYSTI MDAC ID: ITEM:				1:		AT:	ER	PRE	SS	URE	SI	ENSO:	R	(ITI	EM 13	8)			
LEAD ANA	LY	ST	:	G	. RA	FF.	AE:	LLI											
ASSESSME	TNE	:																	
		F	ICAL LIGH W/FU	T	-		RI A	EDUN	DAI	NCY B		CREE		c			I L PEI		
NASA IOA	[2 2	/1R /1R]		[P P]		[F [F]		[]	P]		[X X]	*
COMPARE	[/]		[]	1	[]		[]		Ţ]	
RECOMMEN	IDA!	ri	ONS:		(If	d :	if	fere	nt	fr	om	NASZ	A)						
	[/]		[]	t]	1	[]	(2	[ADD,	/DI	•	ETE)
* CIL RE		NT:	ION 1	RAI	'ION	ALI	Ξ:	(If	ar	pl	ica		7		UATE UATE	_]	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMEN ASSESSMEN NASA FMEA	T	ТГ	١.	FM	EMU-134 BASELI										[]					
SUBSYSTEM MDAC ID: ITEM:	1:			EM 13 FE	4	ΥI	ER	PR	ESS	UF	RΕ	SE	ensoi	R	(1	TEN	1 1	38))			
LEAD ANAI	LYS	T:	:	G.	RAF	F	ΑEΙ	LLI	•													
ASSESSMEN	T:																					
C	CAL LIGH				RI	EDU	NDA	NC	Y	sc	CREE	NS					CI	L EM	ľ			
	H		V/FU				A	REDUNDANCY SCREENS C										•				
NASA IOA	[2 2	/1R /1R]		[P P]]	P F]		[P P]			[]	*
COMPARE	[/]		[]		נ	N]		[]			[]	
RECOMMENI	LA C	·IC	ons:		(If	d :	if	fer	ent	: 1	fro	om	NAS	A)								
	[/]		[]		[]		[]		(A)		'DE		ETE)
* CIL RET	ΓEN	T	ION	RAT	'ION	ΑL	E:	(I	[fa	ıpı	91 :	ica			AI IAI	DEQU	JAT JAT	E E	[]	
REMARKS: THE IOA	AGF	RΕΙ	ES W	ITH	THI	3 1	NA:	SA	ASS	I	SNI	MEI	NTS.									

ASSESSME ASSESSME NASA FME	NT	ID:	EMU	12/10/86 NASA DATA: EMU-144 BASELINE [] 139-FM1, FM4 NEW [X]										
SUBSYSTE MDAC ID: ITEM:			EMU 144 TEM		URE	SENSOR	& H	IARNESS	S (ITE	M 139)			
LEAD ANA	LYS	г:	G. 3	RAFFA	ELLI									
ASSESSME	NT:													
	1	FLIGH	T		NDANCY	SCR	EENS		CI IT	L				
	HI	OW/FU	NC	•	A	В		С						
NASA IOA	[3	3 /3]	[:	P]	[[F]	[[P]	[] *			
COMPARE	[/]	[]	м ј	[11]	[И]	[]			
RECOMMEN	DAT	cons:	(:	If di	ffer	ent fro	om N	ASA)						
	[/]	[]	[]	[]	[(ADD/] DELETE			
* CIL RE								AD	EQUAT EQUAT	•]			
THE IOA	AND	THE :	NASA	ARE :	IN AC	GREEMEN	T.							

ASSESSMEN ASSESSMEN NASA FMEA	II TI	D:	EMU-14	·								
SUBSYSTEM MDAC ID: ITEM:	1:		EMU 146 TEMPER	RATU	RE S	ENSOR	& HA	RNI	ESS (ITEM	4 139))	
LEAD ANAI	LYST	:	G. RAI	FFAE	LLI							
ASSESSMEN	1T:											
C		ICAL:	ITY T	R	EDUN	DANCY	SCRE	ENS	3	CII ITI		
		W/FUI		A		В						
NASA IOA	[3 [3	/3 /3]	[[P]	[[P]	[p]	[] *]	
COMPARE	[/]	[N]	[N]	ſ	N]	[1	
RECOMMENI	DATI	ons:	(If	dif	fere	nt fr	om NA	SA)	}			
	[/]	[]	[]	[1	-] DELETE)	
* CIL RE	PENT	ION I	RATION	ALE:	(If	appl	icabl		ADEQUATI]	
REMARKS:											•	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-143	NASA DATA BASELINE NEW	-	
SUBSYSTEM: MDAC ID: ITEM:	EMU 143 TEMPERATURE	SENSOR & HARN	ESS (ITEM :	139)
LEAD ANALYST:	G. RAFFAELLI	[
ASSESSMENT:				
CRITICAL: FLIGHT		JNDANCY SCREEN	s	CIL ITEM
HDW/FU	-	В	C	IIEM
NASA [2 /1R IOA [2 /1R] [P]] [P]	[P] [[P] [P] P]	[X] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If differ	ent from NASA)	
[/] []	[] [[] D/DELETE)
* CIL RETENTION F REMARKS: THE IOA AND THE N		II	ADEQUATE NADEQUATE	[]

ASSESSMEN ASSESSMEN NASA FMEA	T	ID):		EM		213	ζ									ELI	TA: NE IEW	[]	
SUBSYSTEM MDAC ID: ITEM:	M:				EM 72 SU		(A)	OI	R (I	TEI	M 1	.40))									
LEAD ANAI	LYS	T:			G.	RAI	F	ΑEΙ	LLI													
ASSESSMEN	T.																					
CRITICALITY REI FLIGHT									EDUN	IDAI	ИСУ	S	CREE	NS	;				C]	L EN	ı	
	H	_		SH'I FUI				A			E	3			С				11	. E.P	1	
NASA IOA	[2 2	/: /:	lR lR]		[P P]		[?]		[P P]			[X X]	*
COMPARE	[/]		[]		[]		[]			[]	
RECOMMENI	ľAd	CIC	NS	S:		(If	đ:	if	fere	ent	fı	con	n NAS	A)								
	[/]		[]		[]		[]		(AI	[DD/	DI] ELI	ETE)
* CIL RET																DEQ DEQ			[]	
THE IOA	ANI	ר כ	[H]	E 1	NAS	A A	RΕ	I	N AG	SRE	EMI	INE	Γ.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-756X	NASA DATA: BASELINE NEW	
	EMU 756 SUBLIMATOR (ITEM	140)	
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICAL: FLIGHT		CY SCREENS	CIL
	IC A	В С	ITEM
NASA [2 /1R IOA [2 /1R] [P] [] [P] [P] [P] F]	[X] * [X]
COMPARE [/] [] [N] []	[]
RECOMMENDATIONS:	(If different	from NASA)	
[/F] [] [[] DD/DELETE)
* CIL RETENTION F	RATIONALE: (If app		
REMARKS:		ADEQUATE INADEQUATE	
THE IOA AND THE N THE FAILURE TO BE	NOT DETECTABLE 1	ON SCREEN B. THE I BECAUSE THE UNDESIRA IRST INDICATION AND	BLE EFFECTS

ASSESSME ASSESSME NASA FME	TN:	ID:	12/10/ EMU-13 140-FM	37		NASA DATA: BASELINE [] NEW [X]						
SUBSYSTE MDAC ID: ITEM:			EMU 137 SUBLIN	1ATO	R (I	TEM 1	40)					
LEAD ANA	LYSI	r:	G. RAI	FFAE	LLI							
ASSESSME	NT:											
	I	FLIGHT	r	R A		DANCY B		EENS C		CIL		
NASA IOA		•]	[P]	[P]	[P]	[X] *	
COMPARE	[/]	[]	[]	. []	[]	
RECOMMEN	DAT:	ions:	(If	dif	fere	nt fr	om N	ASA)				
	[/]	[]	[]	[1 ([ADD/D] ELETE)	
* CIL RE		rion i	RATION	ALE:	(If	appl	icab	A	DEQUATE DEQUATE	_]	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: 8/06/87 ASSESSMENT ID: EMU-755X NASA FMEA #: 140-FM3										DATA ELINE NEW			
SUBSYSTEM: MDAC ID: ITEM:		EMU 755 SUBLIM	[ATO]	R (IT	EM	14	10)						
LEAD ANALYS	ST:	G. RAF	'FAE	LLI									
ASSESSMENT	:												
	TICALI FLIGHT	r		EDUND	ANC		SCRE	ENS			CIL		
ŀ	HDW/FUI	NC	A			В			С				
NASA [] AOI	2 /1R 2 /1R]	[P]	[P F]	[P] P]		[X]	*
COMPARE [/]	[]	[N]	[]		[]	
RECOMMENDAT	rions:	(If	difi	feren	t f	rc	m NA	SA)					
ſ	/]	[)	[F]	[]	(Al	[D/DI		ITE)
* CIL RETEN	NTION F	RATIONA	LE:	(If a	app	li	.cabl	•	ADEQU ADEQU		[]	
REMARKS: THE IOA CON UNDESIREABI	E EFFE	CT OF	HELM	MET FO	OGG	IN	G WO	ULD	BE I	HE F	IRST		THE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-142 140-FM4	MU-142 BASELINE							
MDAC ID:	EMU 142 SUBLIMA	ror (ITE	M 140)						
LEAD ANALYST:	G. RAFF	AELLI							
ASSESSMENT:									
		REDUNDA	NCY SCREE	ns	CIL ITEM	ĺ			
FLIGH HDW/FU		A	В	С					
NASA [2 /1R IOA [2 /1R] [P] P]	[P] [F]	[P] [F]	[X [X] *			
COMPARE [/] [1	[N]	[N]	[]			
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)					
[/] []	[F]	[] (A)	[.DD/DE] ELETE)			
* CIL RETENTION	RATIONAL	E: (If a	applicable	adequate]			
REMARKS: THE IOA IS IN AG SCREEN B. BECAU UNDESIRED EFFECT	ISE WATER	CARRYO	VER INTO	HE HELMET T	MA C.				

TECHNIQUE.

ASSESSME ASSESSME NASA FME	NT]	D:	EM	/10/86 U-140 O-FM5	5			NASA DATA: BASELINE [] NEW [X]					
SUBSYSTE MDAC ID: ITEM:			EM 14 SU	0	OR (ITEM 1	.40)						
LEAD ANA	LYSI	?:	G.	RAFFA	ELLI								
ASSESSME	NT:												
•		'ICAL 'LIGH			REDUI	NDANCY	sc	REENS				IL TEM	
	HD	W/FU	NC		A	В			С			IEM	
NASA IOA	[2 [2	/1R /1R]]	P] P]	[P]	[P] F]]	x j x j	*
COMPARE	(/]	[]	[]	[:	N]		[]	
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* CIL RET	ENT	ION 1	RATI	ONALE	: (If	appli	ical	_	ADEO	UATE	г	1	
REMARKS:								INA	ADEQU	JATE	-	-	
THE IOA A NASA SCRE	ND T	THE N	NASA SIGN	ARE I	IN AG	REEMEN	IT.	THE	IOA	AGREE	ES	WITH	THE

ASSESSMENT ASSESSMENT NASA FMEA	ID	:	EMU-13	9							SA DATA BASELINI NEV]	
SUBSYSTEM: MDAC ID: ITEM:			EMU 139 SUBLIM	9 BLIMATOR (ITEM 140)											
LEAD ANALY	ST:		G. RAF	FAE]	LLI										
ASSESSMENT	:														
CR		CALI		R	EDUNDA	ANC	CY	SCRE	ENS	;			IL Pen	4	
		/FUN		A			В			С					
NASA [IOA [2 2	/1R /1R]	[P]	[P F]	[[P P]	[X X]	*
COMPARE [/]	[]	[N]	[]	[]	
RECOMMENDA	TIO	NS:	(If	dif:	ferent	t 1	fro	om NA	SA)						
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REMARKS: THE IOA AN IOA NOW AG												REE	N I	В.	THE

ASSESSME ASSESSME NASA FME								ASA DATA BASELINI NEV]		
SUBSYSTE MDAC ID: ITEM:	M:		EMU 138 SUBLI	TAM	OR (ITEM 1	.40)						
LEAD ANA	LYS	T:	G. RA	FFA	ELLI								
ASSESSME	NT:												
1		TICAL: FLIGH: DW/FUI	r		REDUI	NDANCY E		REENS			IL PEN	M	
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NASA IOA	[2 /1R 2 /1R]	[P] P]	[F]	[P [P]	[[X]	*
COMPARE	[/]	[]	[N]	[]	[]	
RECOMMEN	DAT:	ions:	(If	di	ffere	ent fr	om N	(ASA)					
	[/]	[]	[]	[[\DD/	/DI] ELF	ETE)
* CIL RES	ren'	TION I	RATION	ALE	: (If	appl	icab	AI	DEQUATE DEQUATE]	
REMARKS:										-		-	

THE IOA AGREES WITH THE NASA ANALYSIS.

ASSESSME ASSESSME NASA FME	NT	I):	EM	/10/86 NASA DATA: U-136 BASELINE [] 0-FM8 NEW [X]]									
SUBSYSTE MDAC ID: ITEM:				EM 13 SU		ΑT	OR	R (1	(TE	M	14	10)											
LEAD ANA	LYS	ST	:	G.	RAF	FA	ΕI	LI															
ASSESSME	NT:	:																					
	CRI				•		RE	EDUN	NDA	NC	CY	sc	REF	:NS	3					L CEM	F		
	F		LIGHT 1/FUI				A				В				C					Lil	•		
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COMPARE	[/]		[N]		[]		[]			E]		
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-141 140-FM9			NASA DATA BASELINI NEV					
SUBSYSTEM: MDAC ID: ITEM:	EMU 141 SUBLIMATO	ELIMATOR (ITEM 140)							
LEAD ANALYST:	ST: G. RAFFAELLI								
ASSESSMENT:									
CRITICALI FLIGHT HDW/FUN	CENS	CIL ITEM							
NASA [2 /1R IOA [2 /1R] [P)]	[P] [P]	[P] [P]	[X] * [X]				
COMPARE [/] []	[]	[]	[]				
RECOMMENDATIONS:	(If dif	ferent	from NA	.SA)					
[/] [1.	[]	[] (A)	[] ADD/DELETE)				
* CIL RETENTION F REMARKS: THE IOA AND THE N				e) ADEQUATE INADEQUATE					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-159	FM3	NASA DATA: BASELINE NEW	
MDAC ID:	EMU 159 GAS TRAP ((ITEM 141)		
LEAD ANALYST:	G. RAFFAEI	LLI		
ASSESSMENT:				
CRITICAL FLIGH		EDUNDANCY SCR	EENS	CIL ITEM
	NC A	В	С	
NASA [2 /2 IOA [2 /1R] [] [P] []] [F]	[] [P]	[X] * [X]
COMPARE [/N] [N] [N]	[N]	[]
RECOMMENDATIONS:	(If dif	ferent from N	IASA)	
[2 /1R] [P] [P]	[P] (A)	[] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If applicat	ole) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA BELIEVES COMBINED WITH TH	FAILURE OF	F REDUNDANT O SE EFFECT OF	COOLING FUNCTION	ONS WHEN (LOSS OF LCG

RECOMMENDS PASSAGE OF SCREEN B.

COOLING) CAN RESULT IN LOSS OF LIFE AND THEREFORE WARRANTS A 2/1R CRITICALITY. THE IOA HAS ALSO TAKEN NOTE THAT THE CREWPERSON COULD SENSE THE TEMPERATURE CHANGE AND, THEREFORE,

ASSESSMENT DATASSESSMENT ID:	EMU-16	0		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 160 GAS TR	AP (ITEM	141)		
LEAD ANALYST:	G. RAF	FAELLI			
ASSESSMENT:					
	CALITY	REDUNDA	NCY SCREI	ens	CIL
	FUNC	A	В	С	ITEM
NASA [2 / IOA [2 /	/2] /1R]] P]	[] [P]	[] [P]	[X] * [X]
COMPARE [/	'N] [[N]	[и]	[N]	[]
RECOMMENDATION	S: (If d	lifferent	from NAS	SA)	
[2/	1R] [P]	[P] .		[] DD/DELETE)
* CIL RETENTIO	N RATIONAI	Æ: (If a	pplicable	ADEQUATE	[]
REMARKS: THE IOA CONSID FUNTIONAL "1R" CONSIDERED FAI	WHEN REDU	RST CASE NDANT CO	LOSS OF OLING FUN	INADEQUATE WATER FLOW TO CTIONS ARE A	TO BE A

	: 12/10/86 EMU-158 141-FM4				NASA DAT BASELIN NE	
SUBSYSTEM: MDAC ID: ITEM:	EMU 158 GAS TRAP	(ITEM	141)			
LEAD ANALYST:	G. RAFFA	ELLI				
ASSESSMENT:						
CRITICA FLIG		REDUNDA	MCY	SCREE	NS	CIL ITEM
HDW/F		A	В		С	
NASA [2 /1 IOA [2 /1	R] [R] [P] P]	[P]	[P] [P]	[X] * [X]
COMPARE [/] [1	[]	[]	[]
RECOMMENDATIONS	: (If di	fferent	fre	om NAS	A)	
[/] []	[]	[]	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE	2: (If a	appl	icable) ADEQUATI INADEQUATI	E [] E []
REMARKS: THE IOA AND THE	NASA ARE	IN AGRI	EEME!	NT.		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		MU-161 BASELINE []							
MDAC ID:	EMU 161 GAS TRAP	(ITEM 141))						
LEAD ANALYST:	G. RAFFAI	ELLI							
ASSESSMENT:									
CRITICALI FLIGHT		REDUNDANCY	SCREENS	CIL ITEM					
HDW/FUN	ic 1	A B	C						
NASA [2 /1R IOA [2 /1R] []	P] [P P] [P] [P]] [F]	[X] * [X]					
COMPARE [/] [] [] [N]	[]					
RECOMMENDATIONS:	(If dif	fferent fro	om NASA)						
[/] [] [F		[] DD/DELETE)					
* CIL RETENTION R	ATIONALE:	(If appli	cable)						
REMARKS:			ADEQUATE INADEQUATE						
THE IOA AGREES WITHE REMAINING ASS WATER CARRYOVER ATTECHNIQUE.	IGNMENTS	EXCEPT FOR	SCREEN B. THE	TOA CONSTDERS					

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-113	5		A DATA: SELINE [] NEW [X]
MDAC ID:	EMU 113 WATER RE	ELIEF VALVE	(ITEM 142)	
LEAD ANALYST:	G. RAFF	AELLI		
ASSESSMENT:				
CRITICAL: FLIGH		REDUNDANCY	SCREENS	CIL ITEM
HDW/FU		A B	С	
NASA [3 /1R IOA [3 /1R] [P] [N P] [F	A] [P]] [P]	[x] *
COMPARE [/] [] [N] []	[и]
RECOMMENDATIONS:	(If d	ifferent fr	om NASA)	
[/] [] [F] []	[A] (ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If appl	icable) ADE INADE	QUATE [] QUATE []
REMARKS: WITH THE EXCEPTI ANALYSIS. THE I RELIEF VALVE IS (WHETHER TO PERM	OA RECOM FULLY EX	MENDS FAILU PECTED TO C	RE OF SCREE PERATE DURI	NG A MISSION

REPORT DATE 02/25/88 C-399

FAILURE WOULD

NOT BE READILY DETECTABLE.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-114		NASA DATA BASELINE NEW	
MDAC ID:	EMU 114 WATER RELIEF	VALVE (ITEM	142)	
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICALI FLIGHT	1	DANCY SCREENS	5	CIL ITEM
HDW/FUN	IC A	В	С	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
NASA [3 /1R IOA [2 /1R] [P]] [P]	[NA] [[F] [P] P]	[] * [X]
COMPARE [N /] []	[11]	1	[N]
RECOMMENDATIONS:	(If differe	nt from NASA)	ı	
[2 /1R] []	[F] [] (AD	[] DD/DELETE)
* CIL RETENTION R	ATIONALE: (If	•		
REMARKS:			ADEQUATE IADEQUATE	
THE IOA RECOMMENDO CASE MISSION IMPA- REFLECT CONCURRENT ADDITIONALLY, THE THE ITEM'S OPERAT	CT (LOSS OF 30 T LOSS OF SOP IOA RECOMMEN	0 MINUTES FEE WHICH RESULT DS FAILURE OF	DWATER TIM 'S IN LOSS ' SCREEN B	E) AND TO OF LIFE.

INCLUDE H20 DRAINAGE. SPRING DAMAGE IS ALSO A VIABLE CAUSE.

ASSESSMENT I ASSESSMENT I NASA FMEA #:	D:	12/10/ EMU-11 142-FM	.5				1	NASA DA BASELI N	NE		-	
SUBSYSTEM: MDAC ID: ITEM:		EMU 115 WATER	REL	IEF	VALVE	(ITE	м 1	42)				
LEAD ANALYS	r:	G. RAF	FAE	LLI								
ASSESSMENT:												
CRI		CIL										
	FLIGH DW/FU		A	В			С					
NASA [:	2 /1R 2 /1R]	[E)]	[P [P]	[P] P]		[X [X]	*
COMPARE [/]	[]	[1	[]		[]	
RECOMMENDAT	ions:	(If	dif	fer	ent fr	om NA	SA)					
ĵ.	/]	ľ]	[]	[1	(A	[DD/D		TE)
* CIL RETEN	TION	RATION	ALE:	()	[f appl	icabl		ADEQUA']	
REMARKS: THE IOA AND	THE	NASA A	RE :	N A	AGREEME	NT.						

ASSESSMI ASSESSMI NASA FMI	ENT	· I	D:	EM	/10 U-1 3-F	16								ì	NASA Bas	ELI		[]	
SUBSYSTI MDAC ID: ITEM:				EMI 110 WA	6	C	HE	CK	VAI	LVE		(ITI	EM 1	L 4 3	3)						
LEAD ANA	YLY	ST	:	G.	RA.	FF.	AE:	LLI													
ASSESSME	ENT	:																			
		F	ICAL	r					NDA			SCF	REEN						IL PEM	4	
		nυ	W/FU	NC			A]	В			C	•						
NASA IOA	[3	/1R /1R]		[P P]		[]	F F]	[P)]			[X X]	*
COMPARE	[/)		[]		[]	[]			[]	
RECOMMEN	DA'	ri	ons:	(Ίſ	đ:	ifi	fer	ent	fı	rc	m N	ASA	.)							
	[3	/1R]		[]		[]	[]		(AI	[)D/	'DE] LF	ETE)
* CIL RE													_		DEQU DEQU			[]	
THE IOA	WIA	ر: ر	rur v	HOA	AF	Œ	ΤV	1 A(GKE	LME	N	т.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-117	5		NASA DATA: BASELINE NEW	[x]
MDAC ID:	EMU 117 WATER CH	HECK VALVE	(ITEM 14	3)	
LEAD ANALYST:	G. RAFFA	AELLI			
ASSESSMENT:					
		REDUNDANC	Y SCREENS		CIL ITEM
FLIGH HDW/FUI		A	В	С	11411
NASA [2 /1R IOA [2 /1R] [P] [P]	NA] [F] [P] P]	[X] * [X]
COMPARE [/] [] [и] []	[]
RECOMMENDATIONS:	(If di	ifferent f	rom NASA)		
[/	1 [] [F] [] (AI	[] D/DELETE)
* CIL RETENTION	RATIONALI	E: (If app	olicable)	ADEQUATE IADEQUATE	[]
REMARKS:					
THE IOA AND THE RECOMMENDS ADDIT FAILURE OF SCREETHE RESERVE TANK	ION OF SIN B. TH	PRING FRAC E ITEM'S O	TURE TO 1 PERATION	THE CAUSES IS REQUIRE	AND THE ED TO CHANGE
πυς ρεςερύε πληκ	AND TS	THEREFORE	NOT STRIC	TITE STANDS	OT KUDOMDANI

ASSESSM ASSESSM NASA FM	ENT	' I		El	2/10 MU-1 43-F	18										A DA SELI N		[]	
SUBSYST MDAC ID ITEM:				1:	MU 18 ATER	C	HE	CK	VAI	LVE	:	(IT)	EM 1	43)						
LEAD AN	ALY	ST	:	G.	RA	FF.	ΑE	LLI	• •												
ASSESSM	ENT	:																			
	CR		ICAL LIGH		Z		R	EDU	NDA	NC	Y	SCI	REEN	s					IL CEN	ч	
]	HDI	W/FU	NC			A				В			С						•	
NASA IOA	[2	/1R /1R]]	P P]]	P P]	[P P]			[X X]	*
COMPARE	[/]		[]		[]	[]			[]	
RECOMMEN	IDA!	ric	ONS:		(If	đi	ifi	fer	ent	f	ro	om N	IASA)							
	[/]		[3		[]	[]	;	(AE	[D/	'DE] :LF	ETE)
* CIL RE													-			UATI UATI		[]	
THE IOA	WIAT	1 ر	nr l	IAS	A Ab	Œ	ΤV	I AC	JKE.	EM.	ĽŅ	T.									

ASSESSMEN ASSESSMEN NASA FME	T ID:	EM		3					ASA DA BASELI N	NE	[x	
SUBSYSTEM MDAC ID: ITEM:	1:	EM 21 RE	.3	VAI	VE Al	ND OF	RIFICE	: (I	TEM 14	5)		
LEAD ANA	LYST:	G.	RAF	FAEI	LI							
ASSESSME	T:											
(CRITIC FLI		7	RE	DUND	ANCY	SCREE				CIL	
	HDW/	FUNC		A		В		С				
NASA IOA	[2 /	1R] 1R]		[P]	[P]	[P]		[X] *]
COMPARE	[/]		[]	[]	[]		[]
RECOMMEN	DATION	s:	(If	diff	feren	t fr	om NAS	SA)				
	[/]		[]	[]	[3	(AI	[DD/D] ELETE)
* CIL RE	TENTIO	N RAT	ANOIT	LE:	(If	appl	icable	Α	DEQUAT DEQUAT		[]
REMARKS:									~		•	J

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:	EM	/10/8 U-214 5-FM2										A DATA SELINI NEV	E []	
SUBSYSTI MDAC ID: ITEM:				EM 21 RE		VA	LVE	AN	D	01	RIF	ICE	(I	TEM	i 145))			
LEAD ANA	LY	ST	:	G.	RAFF	ΑE	LLI												
ASSESSME	ENT	:																	
CRITICALITY REDUNDANCY SCREENS FLIGHT HDW/FUNC A B C															IL TE				
	1	HD	W/F	JNC		A				В			С					-	
NASA IOA	[2 2	/2 /2]	[P]		[F]]	P]		[X X]	*
COMPARE	[/]	[N]		[N]	[N]		[]	
RECOMMEN	DA	PI(ONS:	: 1	(If d	if:	fer	ent	f	rc	m 1	NASA)						
	[/]	[]		[]	[]	(A) .DD,	/DI] ELF	ETE)
* CIL RE	TEN	(TI	ION	RATI	IONALI	Ξ:	(I	f a <u>r</u>	qc	li	cab	•			UATE UATE	[]	
THE IOA	ANI]	CHE	NASA	ARE	I	I A	GREE	EM.	EN	T.								

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-215		NASA DATA: BASELINE NEW										
SUBSYSTEM: MDAC ID: ITEM:	EMU 215 RELIEF VALV	VE AND ORIFICE	(ITEM 145)										
LEAD ANALYST:	G. RAFFAELI	LI											
ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL													
CTI													
NASA [3 /2F IOA [2 /1F	[P] [P]] [NA]] [F]	[P] [P]	[x] *									
COMPARE [N /N] [] [N]	[]	[N]									
RECOMMENDATIONS	(If diffe	erent from NAS	A)										
[2 /11	?] [] []	[] (A)	[] OD/DELETE)									
* CIL RETENTION	RATIONALE:) ADEQUATE INADEQUATE	[]									
REMARKS:			ananama IIOI	WINTE TO TO									

THE IOA AGREES WITH THE NASA SCREEN ASSIGNMENTS. HOWEVER, DISAGREEMENT EXISTS ON THE CRITICALITY ASSIGNMENT. IF A SECOND FAILURE OF THE SOP REGULATOR WERE TO OCCUR THE 02 LINES AND VENT LOOP COULD BE EXPOSED TO 200PSI OXYGEN WHICH CAN RESULT IN POSSIBLE LOSS OF STRUCTURAL INTEGRITY AND FIRE (RESULTANT FROM A "VIOLET" LOSS OF STRUCTURAL INTEGRITY).

ASSESSMI ASSESSMI NASA FMI	ENT	I		Ε:	E	2/10 MU-2 46-F	17											DAT ELII NI		[x]	
SUBSYSTE MDAC ID:					EN 21 PC		IV.	E	PRE	essu	JRE	: I	REL	IEF	V	7 A]	LVE	(II)	rem	1	14	6)	
LEAD ANA	LY.	ST	:		G.	RA	FF.	AE:	LLI	•													
ASSESSME	'nТ	:																					
CRITICALITY REDUNDANCY S FLIGHT HDW/FUNC A B													SC	REE	NS	}					IL FEI		
	FLIGHT											В				С					. 11		
NASA IOA]	2	/1 /1	.R .R]]	P P]		[P P]		[P P]			[X X]	*
COMPARE	[/]		[]		[]	1	[]			[]	
RECOMMEN	DA:	ric	ONS	:		(If	di	ifi	fer	ent	f	rc	m 1	NASA	¥)								
	[/]		[]		[]	[•]	(AD	[D/	'DI] ELF	ETE)
* CIL RE	TEI	(T)	CON	R	AT	IONA	LE	Ξ:	(I	f a	.pp	li	.cak	_	4			JATE		<u>[</u>]	
REMARKS: THE IOA	ANI	נ כ	rhe	N	AS.	A AF	Œ	IN	I A	GRE	EMI	ΞN	T.	1	.N.	ΑD	EQU	JATE		[]	

ASSESSME ASSESSME NASA FME	NT I	D:	12/10/ EMU-21 146-FM	6					ASA D. BASEL		[x]	
SUBSYSTEM MDAC ID:	M:		EMU 216 POSITI	VE :	PRESS	SURE 1	RELIE	VA	LVE (ITEM	1 14	6)	
LEAD ANA	LYSI	3:	G. RAF	'FAE	LLI								
ASSESSME	NT:												
	F	CICALIFLIGHT	ר	R A		DANCY B	SCREI	ens C			CII		
NASA IOA	[2	/1R 2 /1R]	[P]	[P]	[P]		(X	[]	*
COMPARE	[/	1	[]	[]	[]		[]	
RECOMMEN	DAT]	cons:	(If	dif	fere	nt fr	om NAS	SA)					
	[/	1	[]	[1	(]	(AI	[DD/I) EL	ETE)
* CIL RE		rion I	RATION	ALE:	(If	appl	icabl	A	DEQUA		[]	
REMARKS:													

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMI ASSESSMI NASA FMI	ENT :	ID:	12/10 EMU-2 146-E	18				N		DATA LINE NEW	[] (]	
SUBSYSTIMDAC ID:			EMU 218 POSIT	'IVE	PRES	SURE	REL:	IEF VA	LVE	(ITE	1 14	16)	
LEAD ANA	ALYSI	:	G. RA	FFAE	LLI								
ASSESSMI	ENT:												
		'ICAL 'LIGH'	ITY T	R	EDUN	DANCY	SCI	REENS			CII		
	HE	W/FU	NC	A		В		С			111	iri	
NASA IOA	[2	/1R /1R]	[P [P]	[N [F	A]	[P]		[X [X]	*
COMPARE	[/]	[]	[N]	[]		[]	
RECOMMEN	DATI	ons:	(If	diff	fere	nt fr	om N	IASA)					
	[/]	[]	[]	[]	(AD	[D/D] ELE	TE)
* CIL RE	TENT	ION F	RATION	ALE:	(If	appl.	icab	AI	DEQUA	TE TE	[]	
REMARKS: THE IOA CONCURS	AND WITH	THE N	IASA AI	RE IN	AGI	REEMEI	NT I	N THAT	THE	IOA	AL	so :	NOW

ASSESSME ASSESSME NASA FME	NT	ID		EM	/06/87 MU-723X 46-FM4					NASA DATA: BASELINE [] NEW []								
SUBSYSTE MDAC ID: ITEM:				72 PO	3	VE	E E	PRES	SUR	E 1	REL:	IEF	VA	LVE	(ITE	M 14	16)	
LEAD ANA	LYS	T:		G.	RAF	F	ÆΙ	LLI										
ASSESSME	ENT:	}																
	CRI		CAL				RI	EDUN	DAN	CY	SC	REEN	S			CII		
	ŀ		/FU				A			В			C	:				
NASA IOA	[3	/3 /3]		[P]	<u>[</u>	P]	[I)		[]	*
COMPARE	[/]		[N]	[N)	(1]		[]	
RECOMMEN	NDA!	ric	ns:		(If	d :	if	fere	ent	fr	om :	nas <i>i</i>	4)					
	[/]		[]	(•]	1	•]	(P	[\DD/1	DEL.	ETE)
* CIL RI	ETEI	T	ON	RAT	'ION	ΑL	Ε:	(If	f ar	pl	ica		1	_	UATE UATE	[]	

THE IOA AND THE NASA ARE IN AGREEMENT.

	SMENT DATE: 12/10/86 SMENT ID: EMU-219 FMEA #: 147-FM1								NASA DATA: BASELINE [] NEW [X]								
SUBSYSTE MDAC ID:				EN 23 NI		Æ	PR	ESSUI	₹E	REL:	IEF V	/ALVE	(ITE	em :	14	7)	
LEAD ANALYST: G. RAFFAELLI																	
ASSESSME	NT	:															
		F	ICAL LIGH W/FU	Г		R		JNDAN	ICY B		REENS	c			IL PEN	И	
NASA IOA	[2	/1R /1R]	(P]	[P P]	[[P] P]		[X X]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DA'	ric	ONS:		(If d	lif	fer	ent	fr	om N	IASA)						
	[/]	[]	[P]	[]	(A	[DD/	'DE] ELE	TE)
* CIL RETREMARKS: THE IOA												ADEQU ADEQU		[]	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-220		NASA DATA: BASELINE [] NEW [X]									
SUBSYSTEM: MDAC ID: ITEM:	EMU 220 NEGATIVE P											
LEAD ANALYST:	G. RAFFAEL	LLI										
ASSESSMENT:												
		EDUNDANCY SCREENS	•	CIL ITEM								
FLIGH HDW/FU	NC A	В	С									
NASA [2 /2 IOA [2 /1R] [] [P] [] [] [P]	P]	[X] * [X]								
COMPARE [/N] [N] [N][и ј .	[]								
RECOMMENDATIONS:	(If diff	ferent from NASA)	ı									
[2 /1R] [P] [P] [[] D/DELETE)								
* CIL RETENTION	RATIONALE:	(If applicable)	ADEQUATE NADEQUATE	[]								
NASA HAS ACTUALI	Y COMBINED 47FM1 - WHI	NASA ANALYSIS. THE EVA PORTION ICH IS A 2/1R CRI	OF THIS FA ITICALITY.	THE IOA								

THEREFORE RECOMMENDS THE EVA PHASE BENALYZED HEREIN AND THE

2/1R CRITICALITY ASSIGNED.

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/8 EMU-221 147-FM3			NASA DATA: BASELINE [] NEW [X]								
SUBSYSTEM: MDAC ID: ITEM:	EMU 221 NEGATIV	E PRESSU	JRE RELIE	EF VALVE (ITE	EM 147)							
LEAD ANALYST:	G. RAFF	'AELLI										
ASSESSMENT:												
CRITICAI FLIGH		REDUNDA	NCY SCRE	ENS	CIL ITEM							
HDW/FU	INC	A	В	C	1 1 DI							
NASA [3 /2F IOA [2 /1F] [P] P]	[NA] [F]	[P] [F]	[] *							
COMPARE [N /N] []	[א]	[N]	[N]							
RECOMMENDATIONS:	(If d	ifferent	from NA	SA)								
[/] []	[]	[] (A	[] DD/DELETE)							
* CIL RETENTION	RATIONAL	E: (If a	pplicabl	ADEQUATE	[]							
REMARKS: THE IOA AGREES W FRACTURE AS A VI	ITH THE 1	NASA ANA	LYSIS BU	INADEQUATE T WOULD INCL	[] UDE SPRING							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-106			NASA DATA: BASELINE NEW	
MDAC ID:	EMU 106 RESERVE	H2O TANK	(ITEM 14	8)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAL: FLIGHT HDW/FU	r	REDUNDANC A	ey screen B	s c	CIL
NASA [2 /2 IOA [2 /1R] [P] [] [P] [P]	[X] *
COMPARE [/N] [N] [и ј [и]	[]
RECOMMENDATIONS:	(If di	fferent i	from NASA	')	
[2 /1R] [P] [P] [[] DD/DELETE)
* CIL RETENTION	RATIONALE	E: (If app		ADEQUATE NADEQUATE	[]
REMARKS: THE NASA FMEA DI FAILURE ON EARLY ALSO, NASA DID N FUNCTION AND, TH FUNCTIONAL CRITICALITY. TH REDUNDANCY AND T	LOSS OF OT CONSIL EREFORE, E IOA BEI	COOLING ADDER THE SO DID NOT DELIEVES THE	AND WATER OP AS PRO FAIL IT I E SOP DOE	R IN THE VENOVIDING A RIES PROVIDE	NT LOOP. EDUNDANT AT THE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/8 EMU-108 148-FM2	6		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID:	EMU 108		K (ITEM 1	-48)	
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL: FLIGHT	ITY T	REDUNDAN	ICY SCREE	INS	CIL ITEM
	1C	A	В	С	IIEM
NASA [2 /1R IOA [2 /1R] [P] [P] [F] P]	[P] [P]	[X] *
COMPARE [/] [) [N]	[]	[]
RECOMMENDATIONS:	(If di	fferent	from NAS	A)	
[[/] []	P]		[] DD/DELETE)
* CIL RETENTION F	ATIONALE	: (If ap) ADEQUATE INADEQUATE	
REMARKS: EXCEPT FOR SCREEN CRITICALITY AND R IOA DISAGREES WIT ASSUMING THE CREW DRAIN THE	EDUNDANC H THE SC	Y SCREEN OPE OF E	ASSIGNMI FFECTS DI	ENTS; ADDITI	ONALLY, THE
RESERVE TANK. TH THEN DRAIN THE PR MINUTE" WATER SUP WOULD BE READILY FAILURE MODE SCOP	IMARY TA PLY BUT DETECTAB	NKS. AS THE ENTI LE BY TH	SUCH NOT RE SUPPLY E CREWMEN	I ONLY THE " Y COULD BE L MBER. REGAR	LAST 30

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-107 148-FM3			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 107 RESERVE	H2O TAN	K (ITEM 1	48)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAL		REDUNDA	NCY SCREE	ns	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [2 /1R IOA [2 /1R] [P] P]	[P] [P]	[P] [P]	[X] * [X]
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If di	ifferent	from NAS	SA)	
[/] []	[]	(A)	[DD/DELETE)
* CIL RETENTION	RATIONALI	E: (If a	applicable	adequate	
REMARKS: THE IOA AND THE	NASA ARE	IN AGRI	EEMENT.		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-7242 148-FM4	x				DATA: ELINE NEW	[]
	EMU 724 RESERVE	WATER	R TANK	(ITEM	148)			
LEAD ANALYST:	G. RAFF	AELLI						
ASSESSMENT:								
CRITICALI FLIGHT HDW/FUN	r			SCREEN			CIL ITE	
		A	В		С			
NASA [2 /1R IOA [2 /1R] [P] P]	[F [F] [P] F]		[] *
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ASSESSMENT DATE: 8/06/87 ASSESSMENT ID: EMU-704X NASA FMEA #: 150-FM1														DATA LINE NEV	3	[]		
SUBSYSTEM: MDAC ID: ITEM:	•		EMU 704 CAU	1	N	ΑN	7 D	WARI	NI	NG	E	LECT:	RO	NICS	6 (I	ΓE	м 1	-51	0)	
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REMARKS: THE IOA A	י מת	THE	NAS	A AF	RE	I	A N	GRE	E	Æ	T.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-466	NASA DATA: BASELINE [] NEW []							
SUBSYSTEM: MDAC ID: ITEM:	EMU 466 CAUTION AND	WARNING EL	ECTRONICS (I	TEM 150)					
LEAD ANALYST:	G. RAFFAELLI								
ASSESSMENT:									
CRITICALI FLIGHT	TY REDU	NDANCY SCRI	EENS	CIL					
HDW/FUN		В	С	ITEM					
NASA [3 /2R IOA [2 /2] [P]] []	[F] []	[P] []	[X] * [X]					
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				NASA DATA: BASELINE NEW	
MDAC ID:	EMU 467 CAUTION	AND WAR	NING ELEC	TRONICS (IT)	EM 150)
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAL FLIGH HDW/FU	r		NCY SCREE	ns C	CIL ITEM
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* CIL RETENTION	RATIONALI	E: (If a	applicable	ADEQUATE	•
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-711X 150-FM12	NASA DATA: BASELINE [] NEW []								
SUBSYSTEM: MDAC ID: ITEM:	EMU 711 CAUTION AND WAI	RNING ELECTRO	NICS (IT	EM 150)						
LEAD ANALYST:	G. RAFFAELLI									
ASSESSMENT:										
CRITICALI FLIGHT HDW/FUN	r	ANCY SCREENS B C		CIL ITEM						
NASA [2 /1R IOA [2 /1R] [P]] [P]	[F] [P]	[X] *						
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ASSESSMEN ASSESSMEN NASA FME	T II		8/06/8 EMU-75 150-FM	-757X BASELINE											
SUBSYSTEM MDAC ID: ITEM:	1 :		EMU 757 CAUTIO	ON AI	1D W2	ARNING	F ELEC	TRO	NICS (ITE	M 1	50)			
LEAD ANA	LYST	:	G. RAI	FFAEI	LLI										
ASSESSME	T:														
(LIGH!	r			DANCY	SCRE				CIL				
	HDV	/FUI	NC .	A		В		С							
NASA IOA	[2	/1R /1R]	[P]	[F [F]	[P]		[X] *			
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REMARKS:															

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-758X	:		NASA DATA BASELINE NEW	
MDAC ID:	EMU 758 CAUTION	AND WARNI	NG ELECT	RONICS (IT	EM 150)
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICALI FLIGHT		REDUNDANC	Y SCREENS	5	CIL ITEM
HDW/FUN	ic i	A	В	С	IIIII
NASA [2 /1R IOA [2 /1R] []	P] [P] [P] [F] [P] P]	[X] * [X]
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ASSESSMENT DAY ASSESSMENT ID NASA FMEA #:		x		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 705 CAUTION	AND WAR	NING ELEC	TRONICS (IT	EM 150)
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITI FL	ns	CIL ITEM			
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SUBSYST MDAC ID ITEM:					EMU 707 CAU	,	N	A	ND	WAR	NI	N	G E	ELEC	T	RO:	NIC	:s	(II)	'EM	1	50)
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SUBSYSTEM MDAC ID:	M:			EMU 462 CAU		ND W	<i>I</i> ARNIN	G EL	ECTR	ONICS	(ITE	M 15	0)
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CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
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ASSESSMEN ASSESSMEN NASA FME	\mathbf{T}	IL		EMU-726X BASELINE NEW EMU]	
SUBSYSTEM MDAC ID: ITEM:	1:			726	S/SOI	P I	MG ((ITE	EM	161)						
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REMARKS:	TS	C	ONCE	RNED	тна	т :	LOCA	L H	от	SPOT	s	CAI	N RESULI	ON	PLS	s or

SOP BOTTLES IF HEAT IS NOT EFFICIENTLY CONDUCTED. IF THIS RESULTS THE OXYGEN BOTTLES COULD RUPTURE VIOLENTLY AND CAUSE LOSS OF LIFE.

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COMPARE	[N	/	1		[]		[]		[N]			[]	
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SUBSYSTE MDAC ID: ITEM:	M:				17	MU 71 20 S	HU	то	FF	VAL	VE	(II)	'EM 1	71)						
LEAD ANA	LY:	ST	:		G.	RA	FF.	AE:	LL:	I											
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ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/10/86 EMU-168 171-FM2, FM4]	ASA DATA: BASELINE [] NEW [X]
SUBSYSTEM: MDAC ID: ITEM:	EMU 168 H2O SHUTOFF VA	LVE (ITEM 171)	J
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICA FLIG HDW/F		ANCY SCREENS B C	CIL ITEM
NASA [3 /2 IOA [3 /2	R] [P] R] [P]	[F] [P [P] [X] *
COMPARE [/] []	[и] [] [N]
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REMARKS: THE IOA AGREES AGREEMENT WITH	WITH THE NASA SC THE REMAINING AN	REEN B ASSIGN	MENT AND IS IN

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-170	NASA DATA: BASELINE [] NEW [X]
MDAC ID:	EMU 170 H20 SHUTOFF VALVE (ITEM	171)
LEAD ANALYST:	G. RAFFAELLI	
ASSESSMENT:		
CRITICALI FLIGHT	r	ITEM
HDW/FUN	_	С
NASA [2 /2 IOA [2 /1R] [] []] [P] [F]	[] [X] * [X]
COMPARE [/N] [N] [N]	[] [[]
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* CIL RETENTION R	RATIONALE: (If applicable	e) ADEQUATE [] INADEQUATE []
REMARKS: THE IOA AGREES WI IOA DISAGREES WIT	TH THE NASA HARDWARE CR	ITICALITY; HOWEVER, TH

FUNCTIONAL CRITICALITY. THE FUNCTIONAL CRITICALITY SHOULD BE A 1R WHEN REDUNDANT FUNCTION FAILURES ARE CONSIDERED. THESE REDUNDANT FUNCTIONS MAY BE REVIEWED DUE TO EARLY MISSION TERMINATION FROM DECREASE IN AVAILABLE BATTERY POWER RESERVE. HOWEVER, BECAUSE OF BATTERY TIME REMAINING MESSAGE THE IOA NOW RECOMMENDS PASSAGE OF SCREEN B.

ASSESSMENT DATASSESSMENT ID:		57					ASA DATA BASELINI NEV		k]	
SUBSYSTEM: MDAC ID: ITEM:	EMU 167 H20 SF	ł UT OF	F VA	LVE (ITEM	171)	•			
LEAD ANALYST:	G. RAI	FFAEL	LI							
ASSESSMENT:										
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NASA [2 , IOA [2 ,	/1R] /1R]	[P [P]	[P]	[P]	[:	x] * x]	
COMPARE [/]	[]	[]	[]	[]	
RECOMMENDATIO	NS: (If	diff	eren	t fro	om NAS	SA)				
[,	/]	[]	[1	[] ([ADD/] DELETI	E)
* CIL RETENTI	ON RATION	ALE:	(If	appl:	icable	A.	DEQUATE DEQUATE]	
REMARKS:										

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-172		ASA DATA: BASELINE NEW	
MDAC ID:	EMU 172 H2O SHUTOFF VAI	LVE (ITEM 171)	
LEAD ANALYST:	G. RAFFAELLI			
ASSESSMENT:				
CRITICALI FLIGHT		ANCY SCREENS		CIL ITEM
HDW/FUN	IC A	В С		
NASA [2 /2 IOA [2 /1R] []] [P]	[] [P]	[X] * [X]
COMPARE [/N] [N]	[N] [N]	[]
RECOMMENDATIONS:	(If different	from NASA)		
[3 /1R] [P]	[P] [P		[] D/DELETE)
* CIL RETENTION R	ATIONALE: (If a	•	DEQUATE	[]
REMARKS:			DEQUATE	
THE IOA AND THE N BECAUSE THE BATTE 30 MINUTES NOTICE LOSS OF THE SOP C IOA RECOMMENDS A	RY MAY BE DRAIN MAY BE TOO LIT AN THEREFORE RE	ED AT A GREAT TLE AND SOP T SULT IN CREWI	TER THAN 1 JSAGE MAY	NORMAL RATE

	12/10/86 EMU-174 172-FM1		1	NASA DATA: BASELINE NEW]
MDAC ID:	EMU 174 COOLANT R	ELIEF VA	LVE (ITEM	172)		
LEAD ANALYST:	G. RAFFAE	LLI				
ASSESSMENT:						
CRITICAL: FLIGH		EDUNDANC	Y SCREENS		CIL	1
HDW/FU			В	C		
NASA [3 /2R IOA [2 /2] [P) [)] [F] [] P] []	P] P]	[X] *]
COMPARE [N /N] [] [ן ו]	[]
RECOMMENDATIONS:	(If dif	ferent f	rom NASA)			
[/] [] [] [] (Al	[DD/DI] ELETE)
* CIL RETENTION	RATIONALE:	(If app	i	ADEQUATE ADEQUATE]
REMARKS:			1147	UNDACUTE	L	,

THE IOA AGREES WITH THE NASA FINDINGS.

ASSESSME ASSESSME NASA FME	NT	II) :	EM	2/10/ IU-13 /2-FI	76	6								DATA ELINE NEW	[x]	
SUBSYSTEM MDAC ID: ITEM:	M:			EM 17 CC	6	ΙT	RI	ELIE	F '	VAI	νE	(IT	EM	ī 172)				
LEAD ANA	LYS	T:		G.	RAI	FFZ	AE)	LLI											
ASSESSME	NT:																		
(FI	CAL LIGH I/FU	r			RI A		DAI	NCY E		CREE	NS	c			I L PEI	M	
NASA IOA	[3 2	/1R /1R]		[P P]		[F	.]		[P] P]		[X X]	*
COMPARE	[N	/]		[]	١	[]		[]		[]	
RECOMMENI	DAT	'IC	NS:		(If	đ	ifi	fere	nt	fr	om	NAS	A)						
	[/]		[]	1]	ļ	[]	(A	[DD/	/DE] ELH	ETE)
* CIL RET	ren	TI	ON 1	RAT	'IONA	LF	€:	(If	aŗ	pl	ica	•		ADEQU ADEQU	JATE JATE	[]	

THE IOA AGREES WITH THE NASA FINDINGS.

ASSESSMEN ASSESSMEN NASA FME	NT ID:	E: 12/10 EMU-1 172-F	73			NASA I BASEI		-	-
SUBSYSTEM MDAC ID: ITEM:	M:	EMU 173 COOLA	NT RE	LIEF V	ALVE (ITEM 172)			
LEAD ANA	LYST:	G. RA	FFAEL	LI					
ASSESSME	NT:								
(CRITICA FLIC HDW/1		RE A	DUNDAN	CY SCR	EENS C		CIL	
NASA IOA	[2 /:	IR] IR]	[P] [P] P]	[P] [P]		[X] *
COMPARE	[/]	[] [.]	[]		[]
RECOMMEN	DATIONS	5: (If	diff	erent	from N	ASA)			
	[/	1	[] []	[]	(AE	[D/D] ELETE)
* CIL RE	TENTIO	N RATION	ALE:	(If ap	plicab	le) ADEQUA INADEQUA]
REMARKS:									

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: 8/06/87

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:		-727X				1		DATA ELINE NEW]	
SUBSYSTIMDAC ID				EMU 727 REAL	L TIME	DAT	A SYS	TEM	(ITE	M 174	!)			
LEAD AN	ALYS	ST	:	G. I	RAFFAE	LLI								
ASSESSMI	ENT	:												
	CRI		ICAL LIGH	ITY T	R	EDUN	DANCY	SCI	REENS			CII		
	F	IDI	W/FU	NC	A		E	3	(2				
NASA IOA]	3 3	/3 /3]	[]	[]	[]]		[] *	t
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	IADI	ľI	ons:	(1	f dif	fere	nt fr	om N	IASA)					
	[/]	ί]	[]	[]	(AI	[DD/I] DELEI	E)
* CIL REREMARKS:									P	ADEQU ADEQU		[]	
		•				, 17GI	نللا لا الله الله الله الله	44.4.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMII-7283	x		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 728 REAL TI	ME DATA	SYSTEM		
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAI FLIG		REDUNDA	NCY SCREE	ns	CIL ITEM
	NC	A	В	С	
NASA [2 /2 IOA [2 /1] [p]	[] [F]	[] [P]	[X] *
COMPARE [/N] [[N]	[N]	[N]	[]
RECOMMENDATIONS	(If d	ifferent	from NAS	A)	
[2 /1]	?][P]	[F]	[P] (A	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	applicable	e) ADEQUATE INADEQUATE	
REMARKS: THE IOA AND THE RECOMMEND THE N RECOMMENDS THE I LIMITING RESIST	ASA PROVI NASA ANAI	DE MORE YSIS ENG	SPECIFIC COMPASS SH	CAUSES. TH IORTS PRIOR	TO THE

OF REDUNDANT FUNCTIONS (C&W, CCC, AND/OR SOP).

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	EMU-322			NASA DATA BASELINE NEW	
MDAC ID:	EMU 322 SOP ASSEI	MBLY (IT	EM 200)		
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAI FLIGH	_	REDUNDAN	CY SCREI	ENS	CIL ITEM
HDW/FC	NC 1	A	В	C	IIEM
NASA [1 /1 IOA [2 /1F] [:] [P]	[] [P]	[X] * [X]
COMPARE [N /N] [1	4] [N]	[N]	[]
RECOMMENDATIONS:	(If dif	fferent i	from NAS	SA)	
[2 /1R] [F	?] [P]		[] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If app	olicable	-	
				ADEQUATE INADEQUATE	[]
REMARKS: THE IOA RECOMMEN BEING WHOLELY WI IMPACT TO THE PL REQUIRE A CONCUR LOSS OF LIFE.	THIN THE S SS AND NOT	OP. THE	FAILUR	TO THE FAIR	LURE NOT ST RESULT IN

ASSESSMENT DATE: ASSESSMENT ID:	12/10/86 EMU-295 200-FM2			NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID:	EMU 295	Y OXYGEN	BOTTLE (
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDA	NCY SCREEN	1 S	CIL ITEM
HDW/FU		A	В	С	
NASA [1 /1 IOA [2 /1R] [P]	[] [P]	[] [P]	[X] * [X]
COMPARE [N /N] [N]	[N]	[и]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)	
[/] []	[]	[] (A)	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA CONCURS RECOMMENDS ADDIT	WITH THE	NASA AI EAL FAII	NALYSIS.	HOWEVER, TH	

ASSESSMI ASSESSMI NASA FMI	ENT	'I	D:	E:	EN	2/10 1U- 2 LO-F	95											A D. SEL	INE]	
SUBSYSTI MDAC ID ITEM:					EN 29 SE		ΑR	Y	οχy	YGEI	1	BO'	rti.	LE (ľ	re:	MI:	210))				
LEAD AND	ALY	ST	:		G.	RA	FF	ΑE	LL]	<u>r</u>													
ASSESSMI	ENT	:																					
		F	ICA LIC W/1	GH.	r			R:	EDU	JNDA	N	CY B	sc	REE	NS	s C					I L TEI		
NASA IOA	[1	/: /:	l LR]		[P]		[P]		[P]			[X X]	*
COMPARE	[N	/1	1]		[N]		[N]		[N]			[]	
RECOMMEN	IDA'	ΓI	ONS	5:		(If	d:	ifi	fer	ent	: 1	rc	om :	NAS.	A)								
	ĺ		/]		[]		[]		[]		(A	[DD/	′DF] ELF	ETE)
* CIL RE REMARKS: THE IOA																		TAU! TAU!		[]	
				•										•									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-296 210-FM2		NASA DATA BASELINE NEW	
	EMU 296 SECONARY O	XYGEN BOTTLE	(ITEM 210)	
LEAD ANALYST:	G. RAFFAEI	LLI		
ASSESSMENT:				
CRITICAI FLIGH HDW/FU	T	EDUNDANCY SCRE B	C C	CIL ITEM
NASA [1 /1 IOA [1 /1] [] [P] []]	[] [F]	[X] *
COMPARE [/] [N] [N]	[N]	[]
RECOMMENDATIONS:	(If dif	ferent from NA	ASA)	
[/] [] []	[] (A)	[] DD/DELETE)
* CIL RETENTION REMARKS:	RATIONALE:	(If applicab)	le) ADEQUATE INADEQUATE	[]

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMI ASSESSMI NASA FMI	ENT	I		EMU	/10/ J-30 BB-F	7										ASA BAS	EL		[x]	
SUBSYSTI MDAC ID: ITEM:				EMU 307 151	7	AGI	E 1	REG	UL	ΑTO	ΟF	R (:	ITE	E M	2	13B	i)					
LEAD ANA	LY	ST	:	G.	RAF	FAI	ΞL	LI														
ASSESSME	ENT	:																				
		F	LIGH	ITY IT INC		1		OUN	DAI		<i>t</i> 3	SCI	REE	:NS	S C					IL PEI		
NASA IOA	[1	/1 /1]	·		·]	1	I	ŗ]]	F]			[X X]	*
COMPARE	[/]			1]		1	N	1]		[N]			ι]	
RECOMMEN	IDA'	ric	ons:	(If o	lif	fe	erei	nt	fr	0	m 1	NAS	A)	ı							
	[/]	1	•]		l	•]		[]		(A		/DE		ETE)
* CIL RE	TE	T	ON	RATI	ONAI	Æ:	(Ίf	aŗ	pl	.i	cak				EQI			[]	
THE IOA CRITICAL	ANI (TI	7 7 8	HE SSI	NASA GNME	ARI	: I	N	AGI	REE	ME	N	тс	N	TH	Œ	ANZ	ALY	SI	S A	MI)	

ASSESSMENT ASSESSMENT NASA FMEA	ID:	12/10/86 EMU-305 213B-FM2			BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:		EMU 305 1ST STAG	E REGU	LATOR (IT	EM 213B)	
LEAD ANALY	ST:	G. RAFFA	ELLI			
ASSESSMENT	':					
CR	ITICAL		REDUND	ANCY SCRE	ENS	CIL ITEM
	FLIGHT HDW/FUN		A	В	С	IIIM
NASA [IOA [1 /1 2 /1R] [] P]	[[] [P]	[X] * [X]
COMPARE [N /N] [и ј	[N]	[N]	[]
RECOMMENDA	TIONS:	(If di	ifferen	t from NA	SA)	
[. /] [3	[]	(a)	[] ADD/DELETE)
* CIL RETE	ENTION 1	RATIONALI	E: (If	applicabl		
					ADEQUATE INADEQUATE	
REMARKS: THE IOA AG	REES W	ITH THE	1/1 CRI	TICALITY	DUE TO THE S	OP BEING AN

EMERGENCY SYSTEM.

ASSESSMENT DATE: 1 ASSESSMENT ID: 1 NASA FMEA #: 2	EMU-306	NASA DATA: BASELINE [] NEW [X]
MDAC ID:	EMU 306 1ST STAGE REGULATOR (ITEM :	213B)
LEAD ANALYST:	G. RAFFAELLI	
ASSESSMENT:		
CRITICALIT FLIGHT HDW/FUNC	_	CIL ITEM C
NASA [1 /1] IOA [2 /1R]] [] [] []] [P] [P] [I	[X] * P] [X]
COMPARE [N /N]] [N] [N] [1	a] []
RECOMMENDATIONS:	(If different from NASA)	
[/]] [] (ADD/DELETE)
REMARKS:		ADEQUATE [] ADEQUATE []
THE IOA AGREES WITEMERGENCY SYSTEM.	TH THE 1/1 CRITICALITY DUE	TO THE SOP BEING AN

ASSESSMEN ASSESSMEN NASA FME	NT ID:	: 1	12/10/ EMU-30 213B-F	3					ASA DAT BASELII NI	ΝE	[x	•
SUBSYSTEMDAC ID:	M:	:	EMU 303 1ST ST	AGE	REGUL	ATOF	e (ITE	M 23	13B)			
LEAD ANA	LYST:	(G. RAF	FAEL	LI							
ASSESSME	NT:											
		CALI' IGHT /FUN	-	RE A	DUNDA	NCY B	SCREE	ns c			CIL	
NASA IOA	·]	[P]	[F]	[P]		[X] *
COMPARE	[,	/]	[]	[]	[]		[]
RECOMMEN	DATIO	NS:	(If	diff	erent	: fro	om NAS	A)				
	[,	/]	[]	[]	[1	(AI	[DD/D] ELETE)
* CIL RE	TENTI	on R	ATIONA	LE:	(If a	ppli	icable	A.	DEQUAT DEQUAT		-]
REMARKS:												

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DA ASSESSMENT ID NASA FMEA #:		2		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	302	AGE REGULA	TOR (ITEM	213B)	
LEAD ANALYST:	G. RAF	FAELLI			
ASSESSMENT:					
	CALITY IGHT	REDUNDAN	CY SCREENS	3	CIL ITEM
HDW,	/FUNC	A	В	С	
NASA [1 , IOA [2 ,	/1] /1R]	[] [[P] [P] [P]	[X] * [X]
COMPARE [N /	/N]	[и]	и ј [n]	[]
RECOMMENDATION	NS: (If o	lifferent	from NASA)		
[/	/] (] [] [] (AI	[] DD/DELETE)
* CIL RETENTIO	ON RATIONAL	E: (If ap	plicable)		
REMARKS:			IN	ADEQUATE IADEQUATE	[]
THE IOA AGREES EMERGENCY SYST	S WITH THE TEM.	1/1 CRITI	CALITY DUE	TO THE SO	P BEING AN

ASSESSMEN ASSESSMEN NASA FME	I TN	D:	EMU-7	29X				N	IASA I BASEI	LINE]	
SUBSYSTEM MDAC ID: ITEM:	M:		EMU 729 FIRST	STAC	GE RE	:GULA	TOR (ITEM	1 213	В)			
LEAD ANA	LYSI	r:	G. RA	FFAE!	LLI								
ASSESSME	NT:												
•		rical Fligh		R	EDUND	ANCY	SCRE	ENS			CIL		
		OW/FU		A		E	3	C					
NASA IOA	[3	3 /3 3 /3]	[]	[]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DAT:	ions:	(If	dif	ferer	nt fr	om NA	SA)					
	[/]	[3	[]	[]	(A	[DD/D	ELF	ETE)
* CIL RE	TEN'	TION	RATION	ALE:	(If	app]	licabl	7	ADEQU ADEQU		[]	
REMARKS: THE IOA	AND	THE	NASA A	RE I	n agi	REEMI	ENT.						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-309		NASA DAT BASELIN NE	
MDAC ID:	EMU 309 2ND STAGE	REGULATOR (ITEM 213D)	
LEAD ANALYST:	G. RAFFAE	LLI		
ASSESSMENT:				
CRITICAL FLIGH HDW/FU	r	EDUNDANCY SCI B	REENS C	CIL ITEM
NASA [1 /1 IOA [2 /1R] [] [P] []]	[] [P]	[X] * [X]
COMPARE [N /N] [N] [N]	[N]	[]
RECOMMENDATIONS:	(If dif	ferent from N	JASA)	
[/] [] []		[] ADD/DELETE)
* CIL RETENTION I	RATIONALE:	(If applicab	le) ADEQUATE INADEQUATE	[]
THE IOA AGREES WIEMERGENCY SYSTEM.	TH THE 1/1	CRITICALITY	DUE TO THE S	SOP BEING AN

ASSESSMEN ASSESSMEN NASA FME	TR	II		EM	/10/ U-31 3D-F	.3								ì		A DA' SELI N	NE]	
SUBSYSTEM MDAC ID:	M:			EM 31 2N	3	'AC	ΞE	REG	GUL	ΓA	OF	٤ (ITEM	1 2	213	D)					
LEAD ANA	LYS	T:	:	G.	RAI	F	ÆI	LLI													
ASSESSME	NT:	:																			
•	CRI		[CAI LIGH	JTY			RI	EDU	ADN	NC	Y	sc	REEN	IS				CI		4	
	H			NC			A				В			(С					•	
NASA IOA	[2 2	/2 /2]]	P]		[F]	((: 1	P]			[X X]	*
COMPARE	[/]		[N]		[N]	1]	N]			Į]	
RECOMMEN	DAT	rIO	ONS:		(If	d:	if	fere	ent	. 1	rc	om	NASA	A)							
	[/]		[]		[]]		(A	[DD/	DI] ELF	ETE)
* CIL RE	TEI	NT:	ION	RAT	ION	AL	E:	(I:	fa	p	ol:	ica				TAUQE TAUQE		[]	
REMARKS: THE IOA	ANI	D !	THE	NAS	A A	RE	I	N A	GRE	E	1E1	T.	•								

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/8 EMU-310 213D-FM	6 2, FM3, FM4	NASA DATA: BASELINE NEW	г 1
SUBSYSTEM: MDAC ID: ITEM:	310	GE REGULATOR (ITEM	213D)	
LEAD ANALYST:	G. RAFF	AELLI		
ASSESSMENT:				
CRITICAL: FLIGHT	ITY r	REDUNDANCY SCREENS		CIL
	4C	A B	С	ITEM
NASA [1 /1 IOA [2 /1R] [P] [P] [NA]	[] *
COMPARE [N /N) [иј [иј [N]	[]
RECOMMENDATIONS:	(If di	ifferent from NASA)		
[/] [] [] [] (AD	[] D/DELETE)
* CIL RETENTION F	RATIONALE	E: (If applicable)	1556	_
REMARKS:		IN	ADEQUATE ADEQUATE	[]
THE IOA AGREES WI EMERGENCY SYSTEM. THREE NASA FAILUR	ADDITI E MODES	l/1 CRITICALITY DUE IONALLY, THE IOA RE INTO ONE DUE TO AL R LIMITATION ON THE	COMMENDS COLUMN	OMBINING TH

213D-FM2 AND 213D-FM3.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-311			NASA DATA BASELINE NEW	
MDAC ID:	EMU 311 2ND STAGE	E REGULA	TOR (ITEM	213D)	
LEAD ANALYST:	G. RAFFAI	ELLI			
ASSESSMENT:					
CRITICAL FLIGH	T		CY SCREEN	rs C	CIL ITEM
HDW/FU	NC 1	A	Б	C	
NASA [1 /1 IOA [2 /1R] [] [P] [P] [NA]	[X] *
COMPARE [N /N] [1	и] [[и]	и ј	[]
RECOMMENDATIONS:	(If di	fferent	from NASA	١)	
] [] [.) [] (A	[] DD/DELETE)
* CIL RETENTION	RATIONALE	: (If ap		ADEQUATE	
REMARKS: THE IOA AGREES W EMERGENCY SYSTEM	ITH THE 1	/1 CRITI	CALITY DU	JE TO THE S	OP BEING AN

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-312		NASA DAT. BASELIN NEV	
	312	REGULATOR (I	TEM 213D)	
LEAD ANALYST:	G. RAFFAE	LLI		
ASSESSMENT:				
FLIGHT	ר	EDUNDANCY SCRI		CIL ITEM
HDW/FU	IC A	В	С	
NASA [1 /1 IOA [2 /1R] [] [P] []]	[] [P]	[X] * [X]
COMPARE [N /N] [N] [N]	[N]	[]
RECOMMENDATIONS:	(If diff	ferent from NA	ASA)	
[/] [] []	[]	[] ADD/DELETE)
* CIL RETENTION R	ATIONALE:	(If applicabl	.e)	
REMARKS:			ADEQUATE INADEQUATE	
THE IOA AGREES WI EMERGENCY SYSTEM.	TH THE 1/1	CRITICALITY	DUE TO THE S	OP BEING AN

	12/10/86 EMU-308 213D-FM7	NASA DATA BASELINE NEV	
MDAC ID:	EMU 308 2ND STAGE REGULAT	COR (ITEM 213D)	
LEAD ANALYST:	G. RAFFAELLI		
ASSESSMENT:			
CRITICAL: FLIGH		CY SCREENS	CIL ITEM
HDW/FU	NC A	ВС	
NASA [1 /1 IOA [2 /1R] [] [] [P] [P] [P]	[X] * [X]
COMPARE [N /N] [N][N] [N]	[]
RECOMMENDATIONS:	(If different i	from NASA)	
[/] [] [] []	[] ADD/DELETE)
* CIL RETENTION	RATIONALE: (If app	plicable) ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AGREES W EMERGENCY SYSTEM		CALITY DUE TO THE S	SOP BEING AN

ASSESSMI ASSESSMI NASA FMI	ENT	I		EM	06/87 J-730X BD-FM8				ì		DATA ELINE NEW]] X]	
SUBSYSTI MDAC ID ITEM:				EM U 730		AGE	REGUL	ATOF	R (ITE	EM 21	.3D)			
LEAD AND	ALY	ST	:	G.	RAFFAE	LLI								
ASSESSMI	ENT	:												
	CR		ICAI LIGH	ITY T	R	EDUI	NDANCY	SCF	REENS			CII		
]	HDI	W/FU	NC	A		В		C	:			-1-1	
NASA IOA	[3 3	/3 /3]	[]]]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[)	
RECOMMEN	IDA!	ric	ons:	(If dif	fere	ent fro	om N	ASA)					
	[/]	[]	[]	[]	(A)	[DD/I] DELE	TE)
* CIL RE									A	DEQU DEQU		[]	
THE IOA	ANI	נ כ	HE	NASA	ARE I	N AG	REEME	IT.						

ASSESSMEN ASSESSMEN NASA FME	T	ID):	EM	/10/ U-31 3D-F	27	1									DA: ELII Ni		[]	
SUBSYSTEM MDAC ID:	M:			EM 31 2N	.2	ΆC	ξE	REG	GUL	ĽΑ	OF	₹ (ITEM	2	13D)					
LEAD ANA	LYS	T:		G.	RAF	F	ÆΙ	LI													
ASSESSME	NT:																				
•							RE	EDUI	NDA	NC	CY	SC	REEN	3				CI	L EN	,	
			IGHT /FUN				A				В			С				11	. Er	1	
NASA IOA	[2	/2 /1R]]	P]		[P]	[P]			[X X]	*
COMPARE	[/N)		[N]		[N]	[N]			[]	
RECOMMEN	DAT	'IC	ons:		(If	đ	ifi	fer	ent	. 1	fro	οń	NASA)							
	[/]		[)		[]	[]		(AI		/DI		ETE)
* CIL RE	TEN	ΤI	ON 1	RAT	'IONA	LI	€:	(I	fa	pr	pli	ica		A A	DEQ DEQ	UAT UAT	E E	[]	
REMARKS: UPON FUR	THE	R	REV:	EEW	THE	:]	[0]	A A	GRE	ES	5 V	IIV	H TH	E]	NAS.	Α.					

ASSESSME ASSESSME NASA FME	ENT	I		EM	∭-3	17									_	A DA SELI N		: [[x]	
SUBSYSTE MDAC ID:				EM 31 SC		RE:	SSI	URE	GA	GE	(ITE	EM 2	13	E)						
LEAD ANA	LY	ST	:	G.	RA	FF	AE:	LLI	• •												
ASSESSME	NT	:																			
		F	ICAL LIGH	r	7			EDU	NDA			SCF	REEN					CI II	L EM	Ī	
]	HDV	/FU	NC			A				В			С							
NASA IOA	[3	/2R /2R]		[P P]		[]	P]]	[[P P]			[]	*
COMPARE	[/]		[]		[3	[]			[]	
RECOMMEN	DA!	ric	ONS:		(If	d:	if	fer	ent	fı	co	m N	IASA)							
	[/)		[]		[]	[]		(AI	[DD/	'DE] LE	TE
* CIL REREMARKS:													•			UAT:]	
TILL TOR	*2741	, ,		כתי	u vi	ند	T I	, W	GVL	للتلنا	111	⊥ •									

ASSESSME ASSESSME NASA FME	ENT	I	D:	12/10/86 NASA DA EMU-316 BASELI 213E-FM2 N										[(]			
SUBSYSTE MDAC ID:				31 SC		RES	sst	JRE	GAG	ΞE	(IT	EM 2	213	E)				
LEAD ANA	ALY:	ST	:	G.	RAI	FFZ	AEI	LLI										
ASSESSME	ENT	:																
	CR		ICAL: LIGH		Z		RI	EDUN	IDAI	NCY	SC	REEN	ıs			CII		
]		W/FU				A			E	3		C	!				
NASA IOA	[[3 3	/2R /2R]		[P P]		[)]	{	P]		[]	*
COMPARE	[/]		[]		[]	(•]		[]	
RECOMMEN	IDA'	TI	ons:		(If	d :	if	fere	ent	fr	om	NAS <i>I</i>	١)					
	[/]		[]		[3	{	•]	(A	[DD/I] DEL	ETE)
* CIL RI		NT	ION :	RAT	TION	AL	E:	(If	f a	ppl	ica	·	A		JATE JATE	[]	
REMARKS:	•																	

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	EMU-314		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 314 SOP PRESSUR	RE GAGE (ITEM	213E)	
LEAD ANALYST:	G. RAFFAELI	·I		
ASSESSMENT:				
FLIG		OUNDANCY SCREE	ns C	CIL ITEM
•				
IOA [2 /1	R] [P]	[] [P]	[] [P]	[X] * [X]
COMPARE [N /N] [N]	[N]	[N]	[]
RECOMMENDATIONS	: (If diffe	rent from NAS	A)	
[/] []	[]		[] DD/DELETE)
* CIL RETENTION	RATIONALE: () ADEQUATE INADEQUATE	[]
REMARKS: THE IOA AGREES EMERGENCY SYSTE	WITH THE 1/1	CRITICALITY D	JE TO THE S	OP BEING AN

	12/10/86 EMU-315 213E-FM4		NASA DATA: BASELINE NEW	
MDAC ID:	EMU 315 SOP PRESSU	URE GAGE (ITEM 2	213E)	
LEAD ANALYST:	G. RAFFAE	LLI		
ASSESSMENT:				
CRITICAL: FLIGH	r	EDUNDANCY SCREEN	1s C	CIL ITEM
HDW/FU	NC A	В	•	
NASA [1 /1 IOA [1 /1] [] [P] []] [F]	[] [F]	[X] * [X]
COMPARE [/] [N] [N]	[и]	[]
RECOMMENDATIONS:	(If dif	ferent from NASA	A)	
[/] [] []	[] I A)	[DD/DELETE)
* CIL RETENTION	RATIONALE:) ADEQUATE INADEQUATE	[]

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSME ASSESSME NASA FME	NT	I	D:	EMU-3	TU-318 BASELINE []													
SUBSYSTE MDAC ID: ITEM:				EMU 318 SOP F	IL.	L I	PORT	QD	Al	ND F	LT	ER	(ITI	EM 2	131	₹)		
LEAD ANA	LY	ST	:	G. RA	FF	AEI	LLI											
ASSESSME	NT	:																
		F	LIGHT	TTY T IC					CY B	SCRI	EENS	s C			C]	[L [EN	ſ	
NASA IOA	[1 2	/1 /1R]	[P]	[P]]	P]		[X X]	*
COMPARE	[N	/N]	[N]	[N]	[N]		[]	
RECOMMEN	DA!	ric	ons:	(If	d:	if1	feren	t :	fro	om N2	ASA)	}						
	[/]	[]	[]	[]	(A	[DD/	'DE] ELE	TE)
* CIL RE											IN		DEQUA					
THE IOA EMERGENC	AGI Y S	REI SYS	ES WI	TH THE	2	1/1	CRI	TI(CAI	LITY	DUE	2 9	TO TH	E S	OP	BE	INC	G AN

ASSESSMEI ASSESSMEI NASA FME	II TR	D:	EMU-3)1	FM7				SA DATA: ASELINE NEW	[]
SUBSYSTEM MDAC ID:	4:		EMU 301 PRESSU	JRE	TRANS	SDUCEI	R (ITE	M 21	5)		
LEAD ANA	LYST	:	G. RAI	FFAE	ELLI						
ASSESSME	NT:										
(ICALI LIGHT		F	REDUNI	DANCY	SCREE	NS		CIL	
			1C	P	Y	В		С			
NASA IOA	[2 [2	/1R /2]	[E	?] ?]	[P [P]	[P]	[X] *]
COMPARE	[/N]	[.]	[]	[]	[]
RECOMMEN	DATI	ons:	(If	dif	fere	nt fro	om NAS	A)			
	[2	/2]	[]	[]	[] (AI	[DD/D] ELETE)
* CIL RE	rent:	ION I	RATION	ALE:	(If	appl:		AD	EQUATE EQUATE	[]
REMARKS:										-	

THE IOA AND THE NASA ARE NOT IN AGREEMENT REGARDING FUNCTIONAL CRITICALITY. A LOW READING (OR LOSS OF OUTPUT) FOR THE PRESSURE TRANSDUCER WILL NOT RESULT IN PERFORMANCE LOSS OF THE SOP BUT IT WILL INCREASE THE URGENCY OF RETURN TO THE ORBITER AIRLOCK. AS SUCH, ONLY ADDITIONAL FAILURES WHICH ARE THEMSELVES LIFE CRITICAL (E.G. EXTERNAL LEAKAGE) CAN RESULT IN A 2/1R AND SHOULD BE KEPT SEPARATE. THE IOA THEREFORE RECOMMENDS A 2/2 CRITICALITY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-300		NASA DATA: BASELINE NEW	
MDAC ID:	EMU 300 PRESSURE	TRANSDUCER (ITEM	215)	
LEAD ANALYST:	G. RAFFAE	ELLI		
ASSESSMENT:				
CRITICAL FLIGH HDW/FU	r	REDUNDANCY SCREENS A B	c	CIL ITEM
NASA [2 /1R IOA [3 /2R] [F	P] [F] [:	P] P]	[X] *
COMPARE [N /N] [] [и] [1	[N]
RECOMMENDATIONS:	(If dif	fferent from NASA)		
[/] [] [] [[] D/DELETE)
* CIL RETENTION	RATIONALE:	·	ADEQUATE	[]
REMARKS: THE IOA AGREES WI CAN POSSIBLY MASI ACCEPTABLE PERFORM	K OTHER SY	ASA ANALYSIS BECAUS STEM FAILURES UND	ADEQUATE SE THIS FA ER THE GUI	ILURE MODE

ASSESSMEN NASA FME	I TV	D:	12/10/ EMU-29 215-FN	7				r	BASELI N]	
SUBSYSTEM MDAC ID:	M:		EMU 297 PRESSU	JRE '	ran:	SDUCE	R (I	TEM 2	215)				
LEAD ANA	LYSI	? :	G. RAI	FAE	LLI								
ASSESSME	T:												
•		CICALI LIGHT		R	EDUN	DANCY	SCR	REENS			IL TEM	Ī	
		W/FUI		A		В		C	2	•		•	
NASA IOA	[1	/1 /1R]	[[P]	[[P]	[[I)] [X X] *	
COMPARE	[]	1 /N]	[N]	[N]	[]	1]	[]	
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om N	IASA)					
	[/]	[]	[3	[]	(ADD	/DE] LET	E)
* CIL RE	rent	TION I	RATION	ALE:	(If	appl	icab	I	DEQUA]	
REMARKS:	A C D E	rec w	ריינו חינו	7 1/	1 CD	ፐጥፐ ሮል	ፒ.ፐጥህ		TAUQADA	•		-	AN

EMERGENCY SYSTEM.

ASSESSMENT I ASSESSMENT I NASA FMEA # :	86 8 4						DATA: ELINE NEW	[]			
SUBSYSTEM: MDAC ID: ITEM:		EMU 298 PRESSU	RE '	TRANS	DUCE:	R (IT	'EM	215)					
LEAD ANALYST	r:	G. RAF	FAE	LLI									
ASSESSMENT:													
I	CICALI FLIGHT	י		EDUND		SCRE	ENS				IL PEM	1	
nı	W/FUN	IC .	A		В			С					
NASA [1 IOA [1	/1]	[[P]	[[F]	[P]		[X X]	*
COMPARE [/]	[N]	[N]	[N]		[]	
RECOMMENDATI	ONS:	(If	dif:	feren	t fro	om NA	SA)						
[/]	[]	[]	[]	(AI	[DD/	'DE] :LE	TE
* CIL RETENT REMARKS: THE IOA AND							•	ADEQU ADEQU	JATE JATE	[]	

ASSESSMENT D ASSESSMENT I NASA FMEA #:	, ,	8A		BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 298 PRESSU	IRE TRANSI	DUCER (ITEM	215)	
LEAD ANALYST	: G. RAF	FAELLI			
ASSESSMENT:					
F	ICALITY LIGHT W/FUNC	REDUNDA A	ANCY SCREENS B	c c	CIL ITEM
	-	[P] [P]	[P] [P] P]	[X] *
COMPARE [N	/N]	[]	[N] [1	[]
RECOMMENDATI	ONS: (If	different	from NASA)	1	
[1	/1]	[]	[] [] (AD	[] DD/DELETE)
* CIL RETENT REMARKS:	ION RATIONA	LE: (If a		ADEQUATE NADEQUATE	[]

THE IOA AND THE NASA ARE NOT IN AGREEMENT; HOWEVER, THE IOA CONCURS WITH THE SEPARATION OF FAILURE MODES (FM4 VS. FM5) TO BE MORE SPECIFIC. BECAUSE A FAILURE OF THE PRESSURE SENSITIVE INTERFACE HAS THE POTENTIAL TO BE VIOLENT WITH A RESULTANT OXYGEN FIRE, THE IOA RECOMMENDS A 1/1 CRITICALITY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-299	5		NASA DATA BASELINE NEW	[]
MDAC ID:	EMU 299 PRESSURE	TRANSI	DUCER (ITE	EM 215)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICALI FLIGHT		REDUNDA	NCY SCREE	ens	CIL ITEM
HDW/FUN	C	A	В	С	
NASA [2 /1R IOA [2 /1R] [P] P]	[F] [P]	[P] [P]	[X] * [X]
COMPARE [/] []	[и]	[]	[]
RECOMMENDATIONS:	(If di	fferent	from NAS	A)	
[/] []	[]	[] (AI	[] DD/DELETE)
* CIL RETENTION R	ATIONALE	: (If a	pplicable	•	
REMARKS:				ADEQUATE INADEQUATE	[]
THE IOA AND THE N B. THE IOA NOW A ADDITIONALLY, THE SCENARIO DEFINED	GREES WI IOA IS	TH THE IN FULL	NASA SCRE	EN B ASSIGNM	MENT.

ASSESSME ASSESSME NASA FME	ID):	12/ EMU 300	-508						DATA LINE NEW	[[]		
SUBSYSTE MDAC ID: ITEM:	M:			EMU 508 SHE		re <i>a</i>	ASSEMB	LY						
LEAD ANA	LYS	ST:		G.	RAFFAE	LLI								
ASSESSME	NT:	3												
	CR1				RI	EDUN	NDANCY	SCR	EENS			CII		
	FLIGHT HDW/FUNC						В		С			TIL	1M	
NASA IOA	[3	/3 /3]	[]	[[]	[[]		[]	*
COMPARE	[/]	ſ]	[]	[]		[]	
RECOMMEN	DAT	ric	NS:	(If dif	fere	ent fr	om N	IASA)					
	[/]	[]	[]	[]	(A)	[DD/I		TE)
* CIL RE	TEN	TI	ON	RATI	ONALE:	(II	f appl	icab	A		JATE JATE]	
THE IOA	ANI	r c	HE	NASA	ARE I	N AC	GREEME:	NT.						

ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-505 NASA FMEA #: 300-FM2 SUBSYSTEM: EMU																DAT SELIN	NE		[
SUBSYSTEMDAC ID:	М:			50	5	P	LA!	re	AS	SE)	MB:	LY	(11	.5])						
LEAD ANA	LYS	ST	:	G.	RAI	FF	AE:	LLI	-												
ASSESSME	NT:	:																			
•	CRITICALITY FLIGHT HDW/FUNC						RI	EDU	IND	AN	CY	sc	CREE	NS	5				CII	_	
	ŀ	IDI	/FUI	NC.			A				В				С						
NASA IOA	[3 3	/3 /2R]]	P]		[P]		[[P]			[[]	*
COMPARE	[/N]		[N]		[N]		[N]			[]	
RECOMMEN	ľAC	'IC	ons:		(If	d:	Ĺfi	fer	ent	: :	fro	om	NAS.	A)							
	[/]		[]		[]		[]	(AD	[D/D	ELI	ETE)
* CIL RET	ren	T)	ON I	RAT	IONA	L	€:	(I	fa	pp	91 i	ica		-			UATE UATE		[]	
THE IOA	AGF	Œ	es wi	TH	THE	1 3	IAS	SA	AN?	L	(S)	ıs.									

ASSESSMEN ASSESSMEN NASA FMEA):	8/06/8 EMU-76 300-FM	OX						ASA DATA BASELINE NEW]	
SUBSYSTEM MDAC ID: ITEM:	1:		EMU 760 DCM EI	ECI	RONIC	s (rı)	EM 35	50)			
LEAD ANAI	LYST	:	G. RAI	FAE	LLI							
ASSESSMEN	T:											
CRITICALITY REDUNDA FLIGHT HDW/FUNC A							CY B	SCREI	ens C		CIL ITEM	
NASA IOA	[3 [3	/1R /1R]	[F	?]	[NA F	\]	[P]	[x] *]
COMPARE	£	/)	(]	[N]	[]	[N]
RECOMMEN	DATI	ons:	(If	dif	feren	ıt :	fro	om NA	SA)			
	[/]	[]	[F]	[] (2	[A ADD/DE	
* CIL RE	TENT	ION :	RATION	ALE:	(If	apj	pl:	icabl	A	DEQUATE DEQUATE]
REMARKS:										_		

THE IOA AND THE NASA ARE IN AGREEMENT EXCEPT ON SCREEN B. THE IOA RECOMMENDS FAILURE OF SCREEN B BECAUSE THE FAILURE MODE IS NOT DETECTABLE AND DOESN'T HAVE AUTOMATIC BACKUP FOR THE REQUIRED FUNCTION. THE IOA THEREFORE RECOMMENDS INCLUSION IN THE CIL.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-507	5				ASA DATA BASELINE NEW	[]	
	EMU 507 SHEAR PI	LATE AS	SEMB	ĽУ						
LEAD ANALYST:	G. RAFFA	ELLI								
ASSESSMENT:										
CRITICAL FLIGH	ITY	REDUNDA	ANCY	SCRE	ENS			IL	_	
HDW/FU		A	В		С		I,	TEN	1	
NASA [2 /2 IOA [3 /3] []	[]	[]]	[X]	*
COMPARE [N /N] []	[]	[]	[N]	
RECOMMENDATIONS:	(If di	fferent	fro	m NAS	SA)					
[3 /3] []	[]	[D /DE		TE)
* CIL RETENTION	RATIONALE	: (If a	ppli	.cable	AI	DEQUATE DEQUATE	[]	
REMARKS: THE IOA RECOMMENT THAT LEAK CHECK : MISSION IMPACT ST	LS PERFOR	MED MAN	LITY	DUE Y AS	ሞር ገ	OA UNDER	200	וא גדי	י דרו	NG NO

ASSESSME ASSESSME NASA FME	NT	ID:	12/10/ EMU-50 300-FN	4				N	NASA DA BASELI N	NE			
SUBSYSTE MDAC ID: ITEM:	M:		EMU 504 SHEAR	PLAT	e As	SEMB	LY (1:	15)					
LEAD ANA	LYS	T:	G. RAI	FAEI	LLI								
ASSESSME	NT:												
		TICAL FLIGH		RI	EDUNE	ANCY	SCRE	ENS			CIL		
		DW/FU		A		В		(2			- -	
NASA IOA	[3 /3 3 /3]	[]]]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	TADI	ions:	(If	difi	ferer	nt fr	om NA	SA)					
	ĺ	/]	[]	[1	[]	(AI	[D D /D] ELE	TE)
* CIL RE	TEN	TION	RATION	ALE:	(If	appl	icabl	1	ADEQUAT ADEQUAT		[]	
REMARKS:													

THE IOA AND THE NASA ANALYSES ARE IN AGREEMENT.

ASSESSMI ASSESSMI NASA FMI	ATE D:	EMU	/10/86 J-506)-FM5				1	NASA DA BASELI N		x]			
SUBSYSTI MDAC ID: ITEM:				EMU 506 SHE		ATE A	ASSEME	LY					
LEAD ANA	LY	ST	:	G.	RAFFAE	CLLI							
ASSESSME	ENT	:											
	CRITICALITY REDU FLIGHT								REENS		CI		
	1			INC	A		В		C	:	IŢ	EM	
NASA IOA	[3	/3 /3]]]	[]	[[]	[]	*
COMPARE	[/]	[]	[]	[]	[]	
RECOMMEN	IDA:	ΓI	ONS:	(If dif	fere	ent fr	om N	IASA)				
	[1.]	[]	[)	[[(ADD/] DELF	ete:
* CIL RE REMARKS: THE IOA									A	DEQUATI DEQUATI]	

ASSESSMENT DATASSESSMENT ID:				N	IASA D BASEL		[]			
SUBSYSTEM: MDAC ID: ITEM:	EMU 503 SHEAR	PLA	TE AS	SEME	BLY (115)						
LEAD ANALYST:	G. RA	FFAE	LLI									
ASSESSMENT:												
	CALITY CGHT	R	EDUNI	DANCY	SCR	EENS			CI	L EM	ſ	
	FUNC	A		E	3	C	2				•	
NASA [2 / IOA [3 /	(2] (3]	[]	[[]]]		[X]	*
COMPARE [N /	[מ׳	[]	[]	[]		[N]	
RECOMMENDATION	NS: (If	dif	ferer	nt fr	om N	ASA)						
[3 /	/3]	[]	[]	[1	(Al		D DE		ETE)
* CIL RETENTION	ON RATION	ALE:	(If	app1	licab		ADEQUA ADEQUA	TE TE	[]	
REMARKS: THE IOA DISAGI AVAILABILITY (MANUAL CAPABI	OF LEAK C					S BEC	CAUSE	OF S	ГНЕ	2	A	MD

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	8/06/87 EMU-759 300-FM7	x		NASA DATA BASELINE NEW	[]					
SUBSYSTEM: MDAC ID: ITEM:	EMU 759 DCM									
LEAD ANALYST:	G. RAFF	AELLI								
ASSESSMENT:										
CRITICAL: FLIGH		REDUNDAN	CY SCREEN	S	CIL					
HDW/FUI		A	B C							
NASA [3 /2R IOA [3 /1R		F] [P] [F] [F] [P] F]	[X] * [X]					
COMPARE [/N] [N] [] [N]	[]					
RECOMMENDATIONS:	(If d	ifferent :	from NASA)						
[3 /1R	J [P] [) [F] (AI	[] DD/DELETE)					
* CIL RETENTION I	RATIONALI	E: (If app	plicable)	ADEQUATE	ſ 1					
REMARKS:			II	NADEQUATE	į					
IF THE ENTIRE NUM RESULT IN SUIT DE SHOULD BE PASSED TURNAROUND. SCRE FAILURE FOR THE S	EPRESSURI DUE TO (EEN C SHO	ZATION AND CAPABILITY OULD BE FA	ID LOSS OF FOR CHECALLED TO F	F LIFE. SO	CREEN A					

ASSESSMENT DAT ASSESSMENT ID: NASA FMEA #:	EMII-36	3	3		NASA DA BASELI N		-
SUBSYSTEM: MDAC ID: ITEM:	EMU 363 SUIT P	RESSUI	RE GAGE	(ITEM	311)		
LEAD ANALYST:	G. RAF	FAELL	[
ASSESSMENT:							
CRITIC FLI	ALITY	REDU	INDANCY	SCREEN	IS	CIL	
		A	В		С		
NASA [3 / IOA [3 /	2R] 2R]	[P] [P]	[P [P] [P] P]]] *
COMPARE [/	1	[]	[] []	[]
RECOMMENDATION	s: (If	diffe	cent fr	om NASA	A)		
[/]	[]	ſ] []	[(ADD/D] ELETE)
* CIL RETENTIO	N RATIONA	LE: ([f appl		ADEQUAT	E []
REMARKS: THE IOA AND TH	E NASA AR	E IN A	AGREEME	NT.			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:						ASA DAT BASELIN NE]
MDAC ID:	EMU 362 SUIT PRES	SSURE (GAGE	(ITE	4 31:	1)		
LEAD ANALYST:	G. RAFFAE	LLI						
ASSESSMENT:								
CRITICALI FLIGHT	ITY F	REDUNDA	ANCY	SCRE	ens		CII	
HDW/FU	NC A	L	В		С			
NASA [3 /2R IOA [3 /2R] [F)]	[P]	[P]	[] *]
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If dif	ferent	fro	om NAS	SA)			
[/] []	[]	[[ADD/D] DELETE
* CIL RETENTION F REMARKS: THE IOA AND THE N					AI	DEQUATE DEQUATE]

ASSESSME ASSESSME NASA FME	NT :	ID:	12/10 EMU-3 311-F	59					ASA DATA BASELINE NEV	E []
SUBSYSTE MDAC ID: ITEM:	м:		EMU 359 SUIT	PRE	SSURE	GAGE	(IT	EM 31	1)		
LEAD ANA	LYS'	T:	G. RA	FFA	ELLI						
ASSESSME	NT:										
	•	TICALI FLIGHT DW/FUN	r		REDUN A	DANCY B		EENS C		CII	
NASA IOA	[:	2 /1R 2 /1R]	[P] P]	[P]	[P]	К] К]	() * ()
COMPARE	[/]	[1	[]	ſ]	[]
RECOMMEN	DAT	ions:	(If	di	ffere	nt fr	om N	ASA)			
	[/]	[]	[3	[] (2	[ADD/E] ELETE)
* CIL RE	TEN'	TION I	RATION	ALE	: (If	appl	icab	A	DEQUATE DEQUATE	_]
REMARKS:											

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:				ASA DATA BASELINE NEW	•]
MDAC ID:	EMU 365 DCM PURGE	VALVE (I	ΓΕΜ 314)			
LEAD ANALYST:	G. RAFFAE	LLI				
ASSESSMENT:						
CRITICALI FLIGHT HDW/FUN	ŗ	EDUNDANCY	SCREENS		CIL ITEN	·I
nDw/ FOR	VC A	. В	C			
NASA [3 /1R IOA [3 /1R] [P] [NA	[P]	[X] *
COMPARE [/] [] [N] []	[]
RECOMMENDATIONS:	(If dif	ferent fro	om NASA)			
[/] [] [] [] (AI	[DD/DE] ELETE)
* CIL RETENTION F REMARKS: THE IOA AGREES WI			AI INAI	DEQUATE DEQUATE	[]

ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-366 NASA FMEA #: 314-FM1													A DAT SELIN NE	E	-]		
	SUBSYSTEMDAC ID:				EMU 366 DCM P	URO	ΞE	VALV	E	(II)	PEM 3 :	14)							
	LEAD ANA	ALY	ST	:	G. RA	FFA	AEI	LLI											
	ASSESSMI	ENT	:																
			F	ICAL: LIGH: W/FUI	נ		RI A	EDUND	AN	CY B	SCRE	ENS	c C			CI	L EN	í	
	NASA IOA	[3	/1R /1R]	[P P]	[N# F	A]]]	P]			[X X]	*
	COMPARE	[/]	[]	[N]	[]			[3	
	RECOMMEN	NDA'	ΓΙ	ons:	(If	đ:	ifí	feren	t	fro	om NA	SA)	ı						
		[/]	[]	[]	[]	(ΑD	[)D/	'DI] ELF	ETE)
	* CIL RI		NT:	ION 1	RATION	ALI	Ε:	(If	ap:	pl:	icabl			QUATE QUATE		-]	
	REMARKS:	:																	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/10/86 EMU-368 314-FM1			nasa da' Baseli N	
MDAC ID:	EMU 368 DCM PURG	E VALV	E (ITEM 3	14)	
LEAD ANALYST:	G. RAFFA	ELLI			
ASSESSMENT:					
CRITICAI FLIGH		REDUND	ANCY SCRE	ENS	CIL ITEM
HDW/FU	INC .	A	В	C	
NASA [3 /1F IOA [3 /1F		P] P]	[NA] [F]	[P] [P]	[X] * [X]
COMPARE [/] []	[N]	[]	[]
RECOMMENDATIONS:	(If di	fferen	t from NA	SA)	
[/] []	[]	[]	[] (ADD/DELETE)
* CIL RETENTION	RATIONALE	: (If a	applicabl	e) ADEQUATI INADEQUATI	• 2
REMARKS: THE IOA AND THE	NASA ARE	TN AGRI	семеми ех	~	

REGARDING WHICH THE IOA NOW AGREES WITH THE NASA.

	: 12/10/86 EMU-367 314-FM2			ASA DATA: BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	EMU 367 DCM PURGE	VALVE (I	PEM 314)			
LEAD ANALYST:	G. RAFFAE	LLI				
ASSESSMENT:						
CRITICA FLIG HDW/F	HT	EDUNDANCY B	SCREENS	:	CIL	ſ
NASA [2 /1 IOA [2 /1] [P] [P]	[X] *
COMPARE [/] [] [] []	[]
RECOMMENDATIONS	: (If dif	ferent fro	om NASA)			
[/] [] [] [] (AI	[DD/DE] ELETE)
* CIL RETENTION	RATIONALE:	(If appl:	A	DEQUATE	[]
REMARKS:						

THE IOA AND THE NASA ARE IN AGREEMENT.

	: 12/10/86 EMU-364 314-FM3		1	NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EMU 364 DCM PURGE	E VALVE (I	TEM 314)		
LEAD ANALYST:	G. RAFFAE	ELLI			
ASSESSMENT:					
CRITICA FLIG HDW/F		REDUNDANCY		:	CIL ITEM
NASA [2 /1] IOA [2 /1]	R] [F	P] [P] [F	·]	[X] * [X]
COMPARE [/] [] [] [-]	[]
RECOMMENDATIONS	: (If dif	ferent fr	om NASA)		
[/] [] [J [[] DD/DELETE)
* CIL RETENTION REMARKS:			A INA	DEQUATE DEQUATE	-
THE IOA AND THE ADDING INTERNAL	NASA ARE I LEAKAGE TO	N AGREEME THIS FAI	NT. THE	IOA WOULI	RECOMMEND

ASSESSM ASSESSM NASA FM	ENT	TΓ) •	EN	111-50	11		FM2						ASA I BASEI		[
SUBSYST MDAC ID ITEM:				50 CC	1	IG	CC	ONTRO	or ,	VAI	LVE	(IT	EM	321))				
LEAD AN	ALYS	ST:	ŀ	G.	RAI	F	AEI	LLI											
ASSESSM	ENT	:																	
		FI	CAL LIGH V/FUI	r			RI A	EDUNI	OAN	CY B	SCI	REEN	s c			CI	[L [E]	1	
NASA IOA	[2 2	/2 /1R]		[P]	[F]]	P]		[X X]	*
COMPARE	[/N]		[N]	[N]	[N]		[]	
RECOMME	NDA'	ric	ons:		(If	d:	if1	ferei	nt :	fro	om 1	NASA	.)						
	[/]		[]	[]	[]	(A)	[DD/	/DI] ELI	ETE)
* CIL R		NTI	ON 1	RAT	NOI	L	Ε:	(If	ap	pl:	ical			DEQU <i>I</i>	ATE ATE	[]	

THE IOA AGREES WITH THE NASA CRITICALITY.

ASSESSME ASSESSME NASA FME	NT I	D:	12/10 EMU-5 321-F	02	6								DATA LINE NEW	[x]	
SUBSYSTE MDAC ID: ITEM:	M:		EMU 502 COOLI	NG	C	ONTR	OL	VA:	LVE	(II)	EM	321)				
LEAD ANA	LYST	1:	G. RA	FF#	AEI	LLI											
ASSESSME	NT:																
1	F	CICALI LIGHT	_		RI A	EDUN	DAN	CY B	sc	REEN	rs C				I L PEI	1	
NASA IOA	[2	/2 /1R]	[P]	[P]	[P]		[X X]	*
COMPARE	[/N]	[N]	[N	3	[N]		[3	
RECOMMEN	DATI	ons:	(If	di	Lff	fere	nt :	fro	om 1	NASA	.)						
	[/]	[]	(]	[]	(AI	[DD/	/DI] ELE	ETE)
* CIL RE	TENT	ION F	RATION	ALE	E:	(If	ap	pl:	ical			DEQUA	ATE ATE	[]	

THE IOA AGREES WITH THE NASA ANALYSIS.

ASSESSMENT DATE: 12/1 ASSESSMENT ID: EMU- NASA FMEA #: 321-						0											NE	: [x	-		
SUBSYST MDAC ID ITEM:				EMU 500 COO	LIN	G (CC	NT:	ROI	٦ ,	/AI	LVI	II) E	'EM	32	1)					
LEAD AN	ALY	ST	:	G. 1	RAF	FA:	ΕI	LI													
ASSESSM	ENT	:																			
	CR		ICAL: LIGH:				RE	DU	NDA	NC	CY	s	CREEN	S				CIL			
		HD	W/FUI	1C		•	A				В			С							
NASA IOA	[2	/1R /1R]		[P P]		[P F]	[P P]			[X]	;	*
COMPARE	[/]		[]		[N]	[]			[]		
RECOMME	NDA'	TI	ons:	(:	Ιf	di	ff	er	ent	: 1	fro	m	NASA	(،							
	[/	3		[]		[]	[]		(A)	[DD/D			ΓE)
* CIL R	ETE:	NT:	ION 1	RATI(ANC	LE	:	(I	fa	pp	oli	LCa	·	A		UAT UAT		[]		
REMARKS THE IOA THE REM	AG					N.	AS	SA .	SCF	RΕΙ	EN	В	AND	IS	IN	AG	RE	EMEN	T	W:	ITH

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-369			NASA DATA BASELINE NEW	
MDAC ID:	EMU 369 COMMON I	MULTIPLE	CONNECT	OR (ITEM 330)
LEAD ANALYST:	G. RAFF	AELLI			
ASSESSMENT:					
CRITICALI FLIGHT HDW/FUN	ľ	REDUNDA A	NCY SCRE	ENS C	CIL ITEM
NASA [2 /2 IOA [3 /1R] [P]	[] [F]	[] [P]	[X] * [X]
COMPARE [N /N] [и]	[N]	[N]	[]
RECOMMENDATIONS:	(If di	ifferent	from NA	SA)	
[3 /1R] [P]	[NA]		[D] DD/DELETE)
* CIL RETENTION F	RATIONALE	E: (If a	pplicable	-	_
				ADEQUATE INADEQUATE	
REMARKS: THE IOA RECOMMENT MISSION SCENARIO. 330-FM1 AND FM2.	OS A 3/1F ADDITI	R CRITIC	ALITY TO THE IOA	REFLECT THE RECOMMENDS	WORST CASE

ASSESSMI ASSESSMI NASA FMI	ENT I	D:	EMU-	375				1	NASA I BASEI		[]	
SUBSYSTI MDAC ID: ITEM:			EMU 375 COMM	ON MU	LTIPI	LE COI	NNE(CTOR	(ITEM	330)			
LEAD AND	ALYST	':	G. R	AFFAE	LLI								
ASSESSMI	ENT:												
		'ICAL 'LIGH'	ITY T	R	EDUNI	DANCY	SC	REENS			CIL		
	HD	W/FU	NC	A		В		(C				
NASA IOA	[2 [2	/2]	[[P]	[[P]	[:] P]		x]]	*
COMPARE	[/]	ĺИ]	[N]	[]	N]		[]	
RECOMME	NDATI	ONS:	(I:	f dif	ferer	nt fr	om 1	NASA)					
	[/]	[]	[]	[]	(AI	[DD/D		ΓE)
	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []												
REMARKS THE IOA TO INCL	AND						NT.	CAU	SES SI	HOULI) BE	EX	PANDED

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	EMU-376		NASA DATA: BASELINE NEW	
MDAC ID:	EMU 376 COMMON MUL	TIPLE CONNECTOR	(ITEM 330)	
LEAD ANALYST:	G. RAFFAEL	LI		
ASSESSMENT:				
FLIGHT		DUNDANCY SCREEN		CIL ITEM
HDW/FUN	IC A	В	С	
NASA [2 /2 IOA [3 /2R] [] [P] [] [] [P] [p]	[] *
COMPARE [N /N] [и] [N][N]	[]
RECOMMENDATIONS:	(If diffe	erent from NASA)	
[2 /2] [] [] [[] DD/DELETE)
* CIL RETENTION R	ATIONALE:		ADEQUATE	[]
REMARKS:		II	NADEQUATE	[]
BECAUSE NSTS 2220 PROCEDURES TO DOW NASA ANALYSIS.	6 PROHIBITS	S USE OF CONTING RITICALITY, THE	ENCY OR OF IOA AGREES	F-NOMINAL WITH THE

ASSESSME ASSESSME NASA FME	TNE	II):	EM	2/10/ M-37 80-FN	77									ASA BASI	ELI		[x]	
SUBSYSTE MDAC ID:				EM 37 CC	77	1 I	(UI	LTIE	PLE	CC	NC	NECTO	PR	()	CTEN	1 3:	30))			
LEAD ANA	ALYS	ST:	:	G.	RAI	FFA	ΑEI	LLI													
ASSESSME	ENT:	;																			
		FI	CAL	T	?			EDUN	IDA		₹ 3	SCREE	ENS	S C					CL CEN	1	
	r	104	V/FU	NC			A			1	>			C							
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COMPARE	ſ		/]		[N] .		[]	V]	[N]			[]	
RECOMMEN	NDAT	ric	ons:		(If	đ:	if	fere	ent	fı	ro	m NAS	SA))							
	[/]		[]		[]	[]		(AI	[DD/	/DI] ELE	ETE)
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THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMENT DATE: 12/10/86 ASSESSMENT ID: EMU-383 NASA FMEA #: 330-FM13													ASA DA BASELI N		[]	
SUBSYSTE MDAC ID: ITEM:				EMU 383 COMMO	N]	MU	LT	'IPLE C	20]	NNEC	ror	(]	ITEM 3	30)				
LEAD ANALYST: G. RAFFAELLI																		
ASSESSME	NT	:																
	CR1		ICAL:	ITY T		RI	ΕD	UNDANC	Y:	SCRI	EENS	3				L CEN		
	F			NC		A			В			С			11	. E.P	1	
NASA IOA	[2	/2 /2R]	[P]	[P]]	P]]	X]	*
COMPARE	[N	/N	1	[N]	[N]	[N]		[N]	
RECOMMEN	DAT	ric	ons:	(If	d:	ifi	fe:	rent f	r	om NA	ASA)							
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REMARKS:											IN	IAL	EQUAT EQUAT	E	[]	
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ASSESSMEN ASSESSMEN NASA FMEA	T ID	: E	2/10/ MU-38 30-FM	2]	NASA DATA BASELINI NEV		
SUBSYSTEM MDAC ID: ITEM:	:	3		MUI	TIPLI	E COI	NNECTO	OR	(ITEM 330	0)	
LEAD ANAI	YST:	G	. RAF	'FAEI	LI						
ASSESSMEN	T:										
C	FL:	CALIT IGHT /FUNC		RE A	DUND	ANCY B	SCREI		c	CI IT	
NASA IOA	·]]			[] *
COMPARE	[,	/ ']		[N]	[N]	[]	и ј	[]
RECOMMEND	ATIO	NS:	(If	diff	erent	t fr	om NAS	SA)			
	[,	/)		[]	[]	[] (2	[ADD/] DELETE)
* CIL REI	ENTI	on RA	TIONA	LE:	(If a	appl	icable		ADEQUATE ADEQUATE	[]

THE IOA AND THE NASA ARE IN AGREEMENT.

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:	12/10, EMU-3 330-FI	78								ASA BASE	LIN		x]	
SUBSYSTEMDAC ID				EMU 378 COMMOI	. T	MU	LTI	PLE C	:01	NNECT	or	(:	ITEM	330	0)			
LEAD AND	ALY	ST	:	G. RA	FF	AE)	LLI											
ASSESSMI	ENT	:																
		F	LIGH	ITY F NC		RI A	EDU	NDANC	Y B	SCRE	ENS	s C				[L [E]		
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COMPARE	[N	/N]	[N]]	N]	[N]		[N]	
RECOMMEN	NDA'	ric	ONS:	(If	d:	ifi	fer	ent f	ro	om NAS	SA))						
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